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SOME PROBLEMS IN THE DIAGNOSIS OF NEPHRITIS

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The diagnosis of nephritis is not always a simple matter. In any large clinic, the question, "Has this patient nephritis?" is constantly arising, and the frequent difficulties in answering are well appreciated. For the purposes of this report a few cases are presented, illustrating rather typical diagnostic problems. The cases are of necessity rather carefully selected, but they present types which occur with sufficient frequency to be worthy of mention. Before discussing actual case histories a very brief résumé is presented of the clinical and laboratory diagnostic tests at our disposal.

In the study of any case of suspected nephritis, the course of procedure at the City Hospital Clinic is about as follows:

A. HISTORY

No laboratory test should ever take precedence over a careful, painstaking history. In our work we have found it valuable to emphasize certain points, as follows: (1) Infections—especially scarlet fever, tonsillitis, frequent colds. (2) Nocturia. (3) Unexplained gastric upsets. (4) Headaches. (5) Indefinite body pains. (6) Muscular weakness. (7) Vision disturbances. (8) Dyspnoea. (9) Edema. (10) Occupation—with especial reference to heavy metals and severe mental strain. (11) Dietary habits—with especial reference to meat, condiments, and alcohol.

B. PHYSICAL EXAMINATION

In addition to the usual examination of the heart, lungs, and abdomen, the examination should include: (1) Fundi. (2) Teeth and throat. (3) Blood Pressure. (4) Condition of peripheral arteries. (5) Question of edema. (6) Blood smear and hemoglobin.

C. ROUTINE URINALYSIS

It is probably a mistake to depend too much upon a 24-hour sample of urine. Single speci-

mens will often show slight variations from the normal, which might be missed in a 24-hour sample. In the place of a sample of a 24-hour amount, a more valuable procedure is to secure the entire 24-hour amount in two separate containers—day and night—representing periods of 12 hours each. In so doing, care should be taken to have supper come at least two hours before the last day collection and to instruct the patient to take no food or fluid from supper time until breakfast the next morning. An increased night amount of urine, with a lowered specific gravity under such conditions, is strong evidence of the presence of nephritis.

D. SPECIAL LABORATORY TESTS

The above are routine or fundamental procedures and because of their routine position they are often under-emphasized. The following are the more specialized laboratory procedures, the so-called renal function tests, and, because of their more exalted names, are often given too much emphasis. That these tests play an important part in the clinical study of any given case of nephritis, no one will dispute. The difficulty arises from the fact that the tests are primarily tests of function and are not, strictly speaking, diagnostic procedures. Lack of attention to this fact has led many to forsake routine clinical methods for new and sometimes unreliable laboratory tests, and has often served to complicate rather than to clarify the problem of a proper diagnosis.

(1) *The Phthalein Test.* Ordinarily, a repeated phthalein output of less than 45 per cent. in two hours indicates renal impairment, providing certain so-called extra-renal conditions are excluded. The most important of these are cardiac decompensation and prostatic obstruction with accompanying renal congestion; cystitis, inanition. Furthermore, a normal phthalein output does not necessarily indicate the absence of nephritis.

(2) *Blood Analysis.* Ordinarily, the blood in nephritis is examined for the total non-protein nitrogen or the urea nitrogen and for uric acid. Of these, the uric acid can be dismissed with a very few words. It has been maintained by some writers that increases in the uric acid are of great value in the diagnosis of early chronic nephritis. In our experience, this claim is not justified, and in the routine study of nephritis but little importance is attached to slight increases in the uric acid readings. The total non-protein nitrogen and the urea nitrogen give

similar information so that it is not necessary to do both. It is somewhat easier to do the urea-nitrogen, and inasmuch as we feel that the information so obtained is just as reliable, we have come to adopt the urea nitrogen as a routine instead of the non-protein nitrogen. Normally, one does not expect to find more than 25 to 35 mgm. of non-protein nitrogen, or more than 20 mgm. of urea-nitrogen in the blood per 100 c.c.

In order to fully understand the significance of blood figures in nephritis or in suspected cases of nephritis, there are a few facts which one must appreciate:

(a) In a well individual the blood urea nitrogen will rise above normal if the person eats a diet abnormally high in protein.

(b) Ordinarily, blood determinations are made after a 12-hour fast. If the person to be tested has been on an abnormally high protein diet, a 12-hour fast is not sufficient to bring the blood down to a constant level.

(c) In kidney congestion, caused from cardiac decompensation or prostatic obstruction, the blood urea nitrogen sometimes rises to very high figures, and will tend to return to normal as soon as the underlying cause of the congestion has been removed.

(d) In many cases of intestinal obstruction, abnormally high figures in blood urea nitrogen or non-protein nitrogen have been reported.

(e) In acute nephritis the urea nitrogen may or may not be increased.

(f) In sub-acute nephritis, or in chronic nephritis with edema, the blood urea nitrogen may remain normal until very shortly before death.

(g) In chronic interstitial nephritis the disease may be well advanced before the blood urea nitrogen becomes abnormal.

It will be seen from the above statements that a rise in the blood urea nitrogen may be due to conditions other than nephritis and that definite nephritis may be present even though the blood urea nitrogen be normal. It is obvious, therefore, that too much dependence cannot be placed upon the blood findings, particularly in cases where the problem is one of diagnosis. As an aid to prognosis, however, especially in the contracted kidney, the blood determinations are of considerable value because they give us a pretty good idea of the amount of kidney damage.

(3) *The Two-Hour Test for Fixation of Specific Gravity.* The instructions for carrying out a two-hour test are as follows:

Meal hours are: Breakfast, 8 a. m.
Dinner, 12 noon
Supper, 5.30 p. m.
Breakfast (next day), 8 a. m.

Patient gets nothing between meals, not even water, and nothing from supper on the day of

the test until breakfast (8 a.m.) the next morning.

DETAILS OF TEST DAY

8 a. m.	Patient voids. Urine need not be saved.	
	Patient has breakfast.	
10 a. m.	Patient voids.	Urine is saved in bottle labeled
		No. 1
		No. 2
12 noon	Patient voids.	
	Patient has dinner.	
2 p. m.	Patient voids.	No. 3
4 p. m.	Patient voids.	No. 4
5.30 p. m.	Patient has supper.	
6 p. m.	Patient voids.	No. 5
8 p. m.	Patient voids.	No. 6
8 a. m.	Patient voids.	No. 7
	Patient has breakfast.	
	(In this same bottle (No. 7) save any urine voided during the night.)	

The test can be done on any ordinary diet, and the only instructions needed are that the patient take about 2000 c.c. of fluid, that the heartiest meal of the day come at noon, and that the diet include a liberal serving of meat and salt. The idea is to put the kidneys under a certain amount of strain for the test day.

The urine specimens are studied for amount and for specific gravity, and a complete urinalysis is done on each separate specimen. Such a procedure very often gives much more valuable information than does the study of the total 24-hour amount. Where it is possible the salt and nitrogen concentration may be studied, but under ordinary conditions this is not essential. Normally, the kidney excretes fluids rapidly, and solids slowly. Also, normally, the night urine is small in amount, generally not over 400 c.c. and high in specific gravity. One would expect, therefore, a considerable variation in the specific gravity during the 24-hour period and also a considerable variation in the amount of urine. The two-hour test is of considerable value as an aid in the diagnosis of early nephritis because, very frequently, variations from the normal appear in this test alone. Also, the test often helps in differentiating cases of renal congestion from cases of true nephritis. Like many of the other tests, the two-hour test is not infallible inasmuch as abnormal variations in it are found in cases of pernicious anemia and diabetes. Moreover, every now and then a case will be found that reacts to the test differently on different days, close together. In doubtful cases, therefore, the tests should be repeated. Several types of two-hour tests are given below.

TYPE 1

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	150c.c.	40	145	50	210	70	275	1040c.c.	1900c.c.
Sp. Gr.	1006	1025	1014	1027	1009	1025	1023		

This is a perfectly normal test. Note that the urine specimens immediately following meals are high in amount and low in specific gravity, that the specimens coming between meals are

low in amounts and high in specific gravity, and that the night urines are moderately small in amount with high specific gravity.

TYPE 2

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	180c.c.	200	75	125	80	105	725	1450c.c.	2000c.c.
Sp. Gr.	1016	1013	1017	1016	1019	1011	1014		

This is a case of hypertension with evident changes in the kidney. Note that the highest specific gravity is 1.019 and the lowest is 1.011, that there is a fair variation in specific gravity up until 6 o'clock at night, after which the specific gravity figures are definitely below what one would normally expect, and also that there is definite nocturia.

TYPE 3

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	110c.c.	50	125	190	160	80	500	1215c.c.	2000c.c.
Sp. Gr.	1012	1013	1015	1010	1010	1008	1006		

In the above test the specific gravity of the first two specimens is about what one would normally expect, but from noon on it will be noted that there is a distinct tendency toward a fixation of specific gravity, and the night amount is high and the specific gravity extremely low. This test illustrates very well how difficult it is to state just how much variation in specific gravity is normal. For example, if one takes the highest specific gravity 1.018 and the lowest specific gravity 1.006, there is a variation of 12 points. However, if the test is studied as a whole it will be noted that the power of the kidney to concentrate urine diminishes as the day advances. This test was done on an early case of chronic nephritis.

TYPE 4

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	30c.c.	45	25	25	85	50	500	545c.c.	1550c.c.
Sp. Gr.	1026	1023	1026	1026	1022	1022	1022		

Note that the specific gravities tend to be fixed at a rather high level, that there is a very poor response to fluid intake, and that the amount of urine at each two-hourly interval tends to be fixed, except that the night urine is not abnormal in amount. This is the type of reaction one is likely to get in cases of myocardial insufficiency with a certain amount of kidney congestion.

TYPE 5

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	300c.c.	190	150	335	185	230	610	1970c.c.	2000c.c.
Sp. Gr.	1009	1012	1009	1008	1010	1007	1011		

This test shows nearly maximum impairment. Note that the specific gravity is definitely fixed regardless of the amount of urine, that the night urine is high in amount and low in specific gravity.

As a result of this brief résumé of the laboratory resources at our disposal in the study of nephritis, one is impressed with the fact that no

single procedure is alone sufficient and that all are subject to limitations. A realization of this fact is extremely important because it is only after we fully realize our limitations, that we are stimulated to apply all the well-recognized procedures in the proper working up of any given case.

The clinical application of the methods outlined is presented below. The cases discussed are few in number and carefully selected. Nevertheless, they represent problems which are very common in any large clinic. In every instance the attempt has been to give a conservative opinion, based on clinical and laboratory findings. That this opinion is subject to criticism we fully appreciate. Also we appreciate the fact that time alone will make possible a final solution of these problems.

Case No. 1.—H., Age 23—Male.

Patient first seen in August, 1922, and is still under observation. (Sept., 1923.)

Past History: Acute rheumatic fever at the age of nine. Frequent sore throat.

Present Illness: Onset about December, 1921, when patient began to complain of frontal headaches, more severe in the morning, and which varied in frequency from several a week to one a month. Since December, 1921, patient has noted occasional spots "before the eyes," and also that he tired very easily.

Physical Examination: A well developed and nourished young man. Tonsils enlarged and cryptic. Blood pressure 130 systolic, 90 diastolic. Eye Examination (Dr. F. Somers Smyth, Boston) showed a small amount of hyperopia in each eye. Fundi normal.

Laboratory Examinations:

(1) Urinalysis—sample of 24-hour amount; specific gravity, 1.023; sugar, none; albumin, slightest possible trace; sediment, normal.

(2) Phthalein—60 per cent. in two hours.

(3) Blood Wassermann reaction—negative.

(4) Blood urea nitrogen—25 mgm. per c.c. of blood.

(5) Two-hour test—

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	640c.c.	240	425	150	0	480	170	2075c.c.	2100c.c.
Sp. Gr.	1002	1008	1008	1020	—	1002	1025		

Albumin Very slight trace in all specimens

Sediment Occasional finely granular and hyaline cast

Comment: The 24-hour amount of urine contains albumin and all the specimens in the Two-Hour Test contain albumin and casts. Also, in the Two-Hour Test, the first three specimens of the day show a fixation of the specific gravity. The blood urea nitrogen is somewhat higher than normal. In the general examination, we find abnormal tonsils and a slightly increased blood pressure.

In August, 1922, we concluded that this patient had a beginning chronic nephritis. Treatment was directed as follows:

Reduction of kidney work (a diet free from condiments and containing about 60 grams of protein was outlined); Tonsillectomy; avoidance of undue mental and physical strain.

Subsequent History: February, 1923.

Patient has been following all instructions faithfully except that the tonsils have not been removed.

Headaches—less frequent; blood pressure—115 systolic, 80 diastolic; urinalysis—24-hour amount, normal; blood urea nitrogen—15 mgm. per 100 c.c. of blood; Two-Hour Test—

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	180c.c.	95	250	175	180	175	295	1230c.c.	1880c.c.
Sp. Gr.	1021	1021	1011	1015	1025	1030	1027		
Albumin	Absent in all specimens								
Sediment	Normal								

Comment: The signs of kidney irritation, which in August, 1922, had been taken as evidence of a beginning chronic nephritis, have entirely disappeared.

May, 1923.

Headaches—about the same as in February; blood pressure—130 systolic, 80 diastolic; tonsillectomy—not yet done; urinalysis—24-hour amount, normal; phthalein—60 per cent. in two hours; blood urea nitrogen—21 mgm.; Two-Hour Test—

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	105c.c.	110	225	125	80	80	175	915c.c.	1500c.c.
Sp. Gr.	1019	1010	1010	1013	1021	1021	1030		
Albumin	None								
Sediment	Normal								

Eye examination—"General eye condition improved. Recently, patient had a central blur almost scotoma, which gradually worked from the center to the periphery. This is typical of some prodromes of migraine. Fundi normal."

Comment: All signs of kidney irritation and of impaired kidney function have disappeared. The report of the eye condition is suggestive, but it is hard to see how a beginning migraine can explain the finding of albumin and casts in the urine.

Summary.—Based on the history and laboratory findings a diagnosis of incipient chronic nephritis was made in this case about one year ago. Since that time all signs of kidney injury have disappeared. In the meantime, the headaches have persisted, but they may be easily explained by the scotoma, together with a beginning migraine. The case suggests the encouraging thought that early chronic nephritis may be aborted by treatment. At any rate, we do not believe that a diagnosis of nephritis can be made at present, but we do believe that both the diagnosis and the course of treatment were justifiable a year ago. The problem cannot be settled until the patient has been under observation for a longer period of time.

Case No. 2.—J. W. Age 15—Male.

Patient first seen in February, 1923. The immediate cause of his coming was life insurance rejection because of albuminuria.

Past History: Unimportant except for mumps in early childhood. As a matter of interest, his history was remarkably free of infections of any sort.

Physical Examination: Normal healthy appearing boy, rather tall for his years. Incidentally, growth had been rapid during the past two years. The tonsils were moderately enlarged, but smooth. The heart was apparently normal in size, but the aortic second sound was definitely accentuated. The blood pressure was 140 systolic, 85 diastolic. Fundi normal.

Laboratory Examinations:

(1) Urinalysis—24-hour sample; specific gravity, 1019; albumin, very slight trace; sugar, none; microscopic examination, normal. 24-hour amount separated into day and night samples:

Day amount—500 c.c. specific gravity, 1011; albumin, very slight trace; sugar, none; microscopic examination, occasional hyaline cast.

Night amount—400 c.c. specific gravity, 1016; albumin, slightest possible trace; sugar, none; microscopic examination, negative.

- (2) Phthalein excretion—75 per cent. in two hours.
- (3) Blood Wassermann reaction—negative.
- (4) Blood urea nitrogen—12 mgm. per 100 c.c. of blood.
- (5) Blood uric acid—3.4 mgm. per 100 c.c. of blood.
- (6) Two-Hour Test—

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	190c.c.	75	200	225	110	320	975	2095c.c.	2200c.c.
Sp. Gr.	1023	1020	1027	1013	1024	1024	1018		
Albumin	None Trace None VST None None None								
Sediment	Normal								

Comment: The absence of any infection in the past history is significant. Physical examination reveals a definitely accentuated aortic second sound, and a blood pressure above normal, a finding confirmed by several subsequent readings. Except in the Two-Hour Test, albuminuria is always present, and both in the Two-Hour Test and in the divided 24-hour amount, there is evidence of a nocturia. The specific gravities of these night amounts, 1018 and 1017, respectively, while not distinctly lowered, is lower than one normally finds in a true night urine. Casts are found once. The phthalein excretion is somewhat higher than normal. This has been found by other workers in cases of supposed beginning chronic nephritis, and has been explained on the basis of a hypermeability due to irritation of the kidney. The blood uric acid is slightly above the usually stated normal figure, but no great significance is given this finding. The patient is a rapidly growing, healthy-appearing boy, tall for his age.

Subsequent History: August, 1923.

Patient has been living a normal, active life since last visit. He has had no symptoms of any sort. Nocturia has been absent. The physical examination showed nothing remarkable except a blood pressure of 130 systolic, 80 diastolic. Examination of a sample of the day and night urine gave the following results: Day urine—specific gravity, 1014; albumin, very slight trace; sediment, rare hyaline cast. Night urine—specific gravity, 1018; albumin, slightest possible trace; sediment, normal.

Summary.—The diagnosis in this case, at the time of the first examination, rested between a beginning chronic nephritis and an orthostatic albuminuria. It is apparent from the two-hour test that the albuminuria is significant. However, in the divided 24-hour amount, both in February and in August, albumin is present in both day and night specimens. Casts are found in cases of orthostatic albuminuria, so this finding is of no particular help. On the other hand, the heart and blood pressure findings together with a nocturia are suggestive of a kidney lesion. At the time this patient was first seen (February, 1923) a diagnosis of beginning chronic nephritis was made and a treatment was outlined very similar to that mentioned under Case No. 1. The present findings are also suggestive of a kidney lesion, so much so that we consider the original diagnosis justifiable. If the patient has early chronic nephritis, the origin is obscure. However, a mild acute nephritis may pass unnoticed, and, furthermore,

repeated mild sore throats may be overlooked, especially in children.

Case No. 3.—A. W. Age 15.—Male.

Patient seen only a few days ago.

Past History: Measles, chicken-pox, tonsillitis several times prior to 11 years ago when the tonsils were removed. Since tonsillectomy patient has been free from sore throats.

Physical Examinations: Essentially negative, except for a slight right lateral dorsal spinal curve, and a slightly increased lumbar curve. The blood pressure was 110 systolic, 75 diastolic. Fundi normal.

Present Illness: Patient was refused life insurance one year ago because of the finding of albumin in the urine. During the past year frequent urine examinations have been made by patient's family physician, and albumin has been present constantly without other findings.

Laboratory Examinations—August, 1923:

(1) Urinalysis—Sample of 24-hour amount—specific gravity 1024; albumin, very slight trace; microscopic examination, normal.

(2) Blood urea nitrogen—14 mgm.

(3) Blood uric acid—1.8 mgm.

(4) Phthalein—60 per cent. in two hours.

(5) Two-Hour Test—

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	130c.c.	75	150	210	65	30	455	1115c.c.	3000c.c.
Sp. Gr.	1015	1025	1015	1010	1025	—	1017		
Albumin	VST	VST	SPT	SPT	VST	SPT	SPT		
Sediment	Negative								

Comment: This Two-Hour Test was done when patient was up and about. Albumin is present in every specimen, but the microscopic examinations are normal. There is a good variation in specific gravity, but the night amount of urine is slightly above what one normally finds and the specific gravity is rather low.

Two-Hour Test:

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	80c.c.	40	75	83	105	75	415	875c.c.	1800c.c.
Sp. Gr.	1022	1025	1025	1027	1027	1025	1023		
Albumin	Trace	Trace	SPT	SPT	SPT	SPT	None		
Sediment	Negative								

Comment: This test was done with the patient in bed. Note that the albumin persists, but that the amount decreases, during the course of the day, and that the night urine is free. The microscopic examination of the sediment is again normal.

The abnormal findings in this case are albuminuria and a slightly excessive night urine. In my opinion this is hardly sufficient evidence to make a diagnosis of nephritis. On the other hand, the absence of the albumin in the night specimen, following a day in bed, suggests the possibility of an orthostatic albuminuria. In this connection the defects in posture are very significant.

Summary.—A boy of 15 who presents himself because of the finding of albumin in the urine. The past history is essentially negative except for tonsillitis early in childhood. Patient is a perfectly normal, healthy-looking boy who has grown rather rapidly in the past year and a half. The kidney function studies are entirely negative except for a slightly increased night amount of urine and the presence of an albuminuria. It is significant that after a day in bed the night urine is free from albumin. This

finding checks up very well with a physical defect in posture. In our opinion, this patient probably has an orthostatic albuminuria.

Case No. 4.—I. B. Age 20.—Male.

Patient first seen in March, 1923.

Past History: Measles, mumps in childhood. Occasional sore throat up to 1918, when a tonsillectomy was performed. During the past few years has noted a moderate amount of dyspnea on exertion, together with some palpitation, and occasional severe frontal headaches. Patient is a very hard-working young man, who is working his way through Law School. It is apparent on close questioning that his diet, during the past two or three years, has consisted largely of protein, chiefly in the form of meat, eggs and milk.

Present Illness: Patient referred because of high blood pressure which was discovered in the course of a routine examination.

Physical Examination: Well developed young man of the stocky type. The left border of cardiac dullness was 1/2 cm. outside the mid-clavicular line. The aortic second sound was definitely accentuated. The blood pressure was 160 systolic, 95 diastolic. Peripheral vessels not thickened. Fundi examination normal. Weight 157 lbs.

Laboratory Examinations:

(1) Urinalysis—24-hour specimen; specific gravity, 1016; albumin, none; sugar, none; microscopic examination, normal.

(2) Blood Wassermann—negative.

(3) Blood urea nitrogen—13.5 mgm.

(4) Two-Hour Test—

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	135c.c.	110	140	165	170	280	950	2025c.c.	2300c.c.
Sp. Gr.	1024	1027	1030	1030	1031	1033	1015		
Albumin	None								
Sediment	Normal								

Comment: History of palpitation and occasional headaches, together with heart and blood pressure findings, are suggestive of cardiovascular changes. Furthermore, there is a history of rather excessive hard work with a diet particularly high in protein. The laboratory findings are normal except for the Two-Hour Test. In this test, there is a definite nocturia (950 c.c.) with a rather low specific gravity (1.015), and during the day, up until six o'clock in the afternoon, the amount of urine in each specimen does not change very much, and the specific gravity tends to be high and fixed. In other words, there is not the usual evidence of ability on the part of the kidney to both dilute and concentrate during the day.

Treatment in this case was planned with the idea of (1) reducing weight, (2) rearranging the diet so as to throw less work on the kidneys.

Subsequent History: August, 1923.

Weight 145 lbs., which represents a loss of twelve pounds since March, 1923. Blood pressure, 140 systolic, 80 diastolic. Patient feels perfectly well, and has none of the symptoms present in March.

Laboratory findings:

(1) Urinalysis—Sample of 24-hour amount—Specific gravity, 1010; albumin, none; sugar, none; sediment, negative.

(2) Two-Hour Test—

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-8	Output	Intake
Vol.	80c.c.	60	475	235	120	200	400	1610c.c.	2000c.c.
Sp. Gr.	1027	1027	1006	1015	1023	1014	1020		
Albumin	None								
Sediment	Negative								

Comment: Since March, 1923, this patient has lost in weight, and all of his previous symptoms

have disappeared. Furthermore, the laboratory studies now are perfectly normal. The blood pressure remains slightly elevated.

Summary.—The case is one of a young man who presented himself because of the finding of a high blood pressure. In the past, there is a history of sore throats and occasional headaches and attacks of palpitation during recent years. Prior to March, 1923, the patient has been under severe mental and physical strain, during which times his diet consisted largely of protein. There is nothing in the history to suggest a previous acute nephritis and the blood Wassermann reaction is normal. At the time of the first examination, the only real evidence of a chronic nephritis was found in the two-hour test as shown by a definite nocturia. It seemed only fair to adopt a conservative attitude, and for this reason the patient was told that he probably had a beginning chronic nephritis. As a result of dietary treatment, the patient lost twelve pounds from March to August. Also when seen in August, his previous symptoms had disappeared. His blood pressure remains moderately elevated. The last two-hour test is normal.

It is possible that this patient's symptoms and physical findings were due to his mode of life at the time—severe mental and physical strain, together with a high protein diet. At any rate, a change in mode of living and a loss in weight has resulted in considerable improvement in symptoms and laboratory findings. At present the evidence is not sufficient to make a diagnosis of early chronic nephritis.

Case No. 5.—I. B. Age 38—Male.

Past History: Acute rheumatic fever at the age of 18. Neisser infection at the age of 22. Influenza in September, 1918. In July, 1919, patient had a severe attack of tonsillitis, followed shortly by a typical attack of acute nephritis associated with headache, edema of the face and extremities, scanty and bloody urine.

The laboratory record of his acute nephritis is as follows:

In hospital from August, 1919, to October, 1919.

(1) Urinalysis—at entrance, small in amount; high specific gravity; albumin, large trace; sediment, many fine and coarse granular casts, many red blood cells, numerous white blood cells. At discharge specific gravity, 1010; albumin, trace; sediment, rare hyaline cast and rare red blood cells.

(2) Blood pressure at entrance 140 systolic, 80 diastolic. At discharge—120 systolic, 65 diastolic.

(3) Phthalein—at entrance 20 per cent. in two hours. At discharge 30 per cent. in two hours.

(4) Blood urea nitrogen—35 mgm. at entrance. At discharge 15 mgm.

(5) Two-Hour Test at time of discharge—October, 1919.

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-9	Output	Intake
Vol.	93c.c.	135	101	130	103	105	700	1347c.c.	1500c.c.
Sp. Gr.	1012	1010	1012	1013	1011	1011	1019		
Albumin	Very slight trace in all specimens								
Sediment	Occasional fine granular and hyaline cast in all specimens								

Comment: In the Two-Hour Test there is a fixation of specific gravity at a low level and a nocturia.

Also note that at the time of discharge from the hospital the phthalein test remains low and the urine contains albumin, casts and blood.

Since October, 1919, this patient has been under careful observation in the Out-Patient Department. The question now arises, is this patient a cured case or a case of beginning chronic nephritis?

The record of his clinical and laboratory studies from October, 1919, to March, 1923, is as follows:

Clinical Studies: Clinically, the patient has felt perfectly well since January, 1920, and has been steadily at work as a fireman. There have been no headaches, no nocturia, no dyspnoea.

Physical Findings: Blood pressure and fundus examination constantly normal since October, 1919. Physical examination otherwise not remarkable.

Laboratory Studies:

(1) Urinalysis—at the time the patient left the hospital the urine was low in specific gravity and still contained albumin and casts and blood. Since January, 1920, the urine has been absolutely normal in respect to the albumin and sediment, but the specific gravity has tended to remain rather low.

(2) Phthalein—At time of discharge from the hospital the phthalein output was 30 per cent. in two hours. In June, 1920, it was 50 per cent. in two hours, and has since remained perfectly normal.

(3) The blood urea nitrogen has constantly remained within normal limits.

(4) Two-Hour Test—January, 1920.

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-9	Output	Intake
Vol.	110c.c.	495	140	125	165	300	825	1900c.c.	2000c.c.
Sp. Gr.	1016	1006	1011	1020	1016	1008	1016		
Albumin	None								
Sediment	Negative								

Comment: Note that in this test there is a decided improvement in the ability of the kidney to concentrate, but there is still evidence of nocturia, and the specific gravity of the night urine is lower than normal.

Two-Hour Test—September, 1920.

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-9	Output	Intake
Vol.	206c.c.	210	250	355	270	130	245	1886c.c.	2300c.c.
Sp. Gr.	1015	1010	1010	1013	1014	1014	1022		
Albumin	None								
Sediment	Negative								

Comment: There is a definite tendency toward fixation of specific gravity during the day, but the night urine is normal in amount with a normal specific gravity. A test of this sort indicates a source of error in depending entirely upon separate day and night amounts of urine in order to indicate the presence of a nephritis inasmuch as we consider a reaction of this kind to be definitely abnormal.

Two-Hour Test—March, 1921.

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-9	Output	Intake
Vol.	70c.c.	135	300	300	160	335	315	1585c.c.	2000c.c.
Sp. Gr.	1027	1023	1010	1013	1013	1010	1025		
Albumin	None								
Sediment	Negative								

Comment: This test is, we believe, perfectly normal.

Two-Hour Test—August, 1922.

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-9	Output	Intake
Vol.	85c.c.	100	90	180	110	260	310	1135c.c.	2000c.c.
Sp. Gr.	1010	1012	1015	1012	1012	1012	1008	1010	
Albumin	Slightest possible trace								
Sediment	Negative								

Comment: This test seems to indicate some inability on the part of the kidney to concentrate properly. For

example, there is a fixation of gravity in the first four specimens. The night urine remains low in amount, but the specific gravity is not as high as one would naturally expect.

Two-Hour Test—March, 1923.

Time	8-10	10-12	12-2	2-4	4-6	6-8	8-9	Output	Intake
Vol.	250c.c.	330	365	210	180	135	600	1990c.c.	2000c.c.
Sp. Gr.	1011	1014	1012	1015	1024	1030	1018		
Albumin	Slightest possible trace								
Sediment	Negative								

Comment: This test is distinctly abnormal in that there is a fixation of specific gravity early in the day, and the night urine is excessive in amount with an abnormally low specific gravity.

Summary.—The history is one of a young man who had a perfectly definite attack of acute nephritis in August, 1919. The signs and symptoms of the nephritis cleared up almost entirely by January, 1920, with the exception that some slight abnormality in the two-hour test persisted until June, 1920. Since then, there has been no evidence whatsoever of any abnormality, either in clinical or laboratory findings until March, 1923, when a two-hour test gives evidence of impaired function. It is altogether too early to say whether or not this patient has a beginning chronic nephritis, but the present findings are very suggestive. This case illustrates how important it is to follow acute nephritides over a long period of time before stating definitely that the case is cured.

Summary and Conclusion.—This report introduces certain difficulties in the diagnosis of nephritis, as illustrated by a few carefully selected cases. As an aid in the discussion, a brief résumé is given of the clinical and laboratory diagnostic procedures at our disposal. It is evident that these procedures often fail to give definite information; in other words, that they are not infallible. For this reason every case of suspected nephritis deserves careful study over a long period of time. Moreover, in any suspected case in a young person, the condition known as orthostatic albuminuria must be considered. Of necessity this study is incomplete, and the types of cases presented are few, but even though incomplete, it is to be hoped that the report emphasizes the fact that the diagnosis of nephritis is not always easy, that definite information often cannot be given until a case has been carefully studied over a long period of time, and that without such repeated observations, errors in diagnosis must be frequent.

FIRST AID INSTRUCTION CAR

THE Red Cross has sent its first aid instruction car over the lines of the Illinois Central Railroad to New Orleans, returning north to Chicago and Omaha. The trip will be completed in about three months. Already more than fifty thousand people have been reached through this service.

CLINICAL APPLICATION OF THE CHEMISTRY OF DIGESTION

BY C. W. McCLURE, M.D., BOSTON

[From the Evans Memorial, Boston]

THE present paper is a discussion of the principles of the chemistry of normal and abnormal digestion, and comprises descriptions of the comparatively few chemical changes and processes whose occurrence is fairly well established. In addition, the relation of this subject to clinical medicine will be outlined.

Until recently the state of knowledge concerning the chemistry of digestion has been of relative unimportance to the practitioner of medicine, for the reason that he has not been able to make practical application of such knowledge. The practitioner, therefore, has acquired the habit of viewing physiological studies with little interest. On the other hand, the physiologist has not investigated the practical problems of clinical medicine. As a result, the physiologist has developed a viewpoint so different from that of the clinician that he has scant sympathy with the problems of clinical medicine. In other words, the problems attacked by the two and the aims of the two are intrinsically different. The physiologist is concerned largely with the establishment of the great laws governing the functions of animal life. Because of the magnitude of the problems involved, details of the mode of functioning of organs of a single species is apt to be of minor importance. On the other hand, the injurious effects of diseased conditions in man are often the result of alterations in the normal functioning of organs. For this reason, knowledge of functional detail, so often unimportant to the physiologist, becomes of paramount importance to the practising physician. Unfortunately, the minor importance to physiologists of such details of function has retarded development of knowledge concerning them. As a result, there exists in many pathological conditions affecting the organs of man a wide chasm between what is known of how the abnormal organ functions and the clinical manifestations to which the abnormal function gives rise. This chasm is so wide that the physician often finds his knowledge of physiology to be of little or no assistance in the actual practice of medicine. Therefore, in order to make available for use in clinical medicine the vast store of information accumulated by physiologists, it is necessary to span this chasm by establishing the details of functions of organs or parts of organs of man. With this end in view, the present author and his colleagues have studied the details of some of the chemical functions of the alimentary tract of man, both in normal and diseased states, and this work will furnish the basis of the present lecture.

Of the various chemical functions ascribed to the stomach there are but two which have been fully established. These two are, first, that the stomach secretes HCl and pepsin; and, secondly, that these two substances bring about the so-called gastric digestion of proteins.

Pepsin is an enzyme, which will act only on proteins. In order that it may carry on the gastric digestion of proteins efficiently, the protein on which it acts must be suspended in an acid medium. This acid medium is furnished by the secretion of HCl by the stomach's mucous membrane. All protein is by no means digested before it leaves the stomach. That which is digested is split up, through a great many chemical stages, into substances which are far less complex than are proteins. In other words, protein substances are composed of a great many different kinds of chemical bodies which are united together and form the so-called protein molecule. These component chemical bodies are called radicles. Thus, gastric digestion starts off with a protein molecule composed of a huge complex of radicles. The pepsin tears off groups of these radicles from the original protein molecule, and thereby forms new chemical entities of less complexity. In turn, pepsin tears off groups of radicles from these new chemical entities, and so on until fairly simple chemical bodies, called peptones, are formed. Concerning that part of a protein meal which leaves the stomach undigested, there are slight experimental and clinical evidences indicating that the protein is better prepared for its subsequent digestion in the intestines than if it had not passed through the acid-pepsin medium of the stomach. Studies which are under way on patients whose stomachs do not secrete HCl may possibly throw more light on this phase of digestion.

The quantity of acid fluid secreted by the stomach can be roughly determined by siphoning off the gastric contents with the stomach tube. The acidity of the material obtained can be estimated very roughly by titration, or accurately determined by means of a physical instrument called the potentiometer. The pepsin content can be fairly accurately determined by means of a method devised by the author and Schabacher.¹ Such determinations have been made and average values for normal persons have been established. With these values as a basis, some comparative studies of the chemistry of the stomachs of patients suffering with indigestion have been made. These studies, together with those of numerous previous investigators, have definitely established that too much or too little acid secretion may occur. While the stomach may contain too small an amount of acid, it is questionable whether an abnormally high concentration of acid is ever secreted. Diminished amounts of pepsin accompany diminished amounts of acid.

The above discussion concerns well-established

physiologic and pathologic facts. But they seem to have fallen into disrepute with the practitioner of medicine, as is evidenced by the slight attention he gives them. Here again the medical practitioner has believed that physiological knowledge has failed to be of much benefit. Probably the reason for this lies very largely in an erroneous interpretation of abnormal chemistry of digestion. The clinician has been prone to often consider these abnormal chemical changes as clinical entities, and has attempted to cure them by direct therapy. But such therapy has usually produced only temporary relief. The fact of the matter is that abnormal gastric chemistry is the result of some underlying diseased condition, and the cure of the abnormal gastric chemistry depends on the cure of the causative disease. The underlying disease² may be primary in the gastro-intestinal tract, such as peptic ulcer; it may be the result of organic disease in other organs, such as cholecystitis; it may be the result of some extrinsic poison, such as mercury or lead. Perhaps abnormal gastric chemistry is of more importance to the clinician when it furnishes evidence of food retention and, secondly, when free HCl is absent from the gastric contents. Definite food retention is valuable evidence of pyloric obstruction. The absence of free HCl is often of great value in differentiating between ulcer and cancer of the stomach, and in explaining certain types of intractable diarrhea. Thus, abnormal gastric chemistry merely furnishes a train of symptoms which are to be interpreted in clinical medicine on the same principle as are symptoms from any other source. When viewed from this standpoint, the physiology and pathology of the chemistry of gastric digestion become of much practical importance to the physician.

In addition to the secretion of HCl and pepsin, physiologists often claim that the stomach manufactures a fat-digesting enzyme and a hormone, and that the ptyalin of saliva continues to act after food enters the stomach. But these claims at present are not fully proved. It is, therefore, correct to state that the present definite knowledge of the chemistry of the gastric digestion ends with the secretion of HCl and pepsin and their action on protein foods.

A function has been ascribed to the HCl of the stomach, other than that concerning the digestion of proteins. This function is that the HCl of the stomach governs the opening and closure of the pyloric sphincter; i.e., the so-called acid control of the pylorus. However, recent studies³ have made the basis of this postulation insecure. As much as the clinician needs to know is the physiological fact that, regardless of the chemical reaction of the stomach or duodenum, the pyloric sphincter opens in an orderly and rhythmical manner at all times unless some pathological lesion obliterates it or produces sufficient irritability of the muscle to bring

about a state of spasm. Such lesions may be intrinsic or extrinsic to the gastro-intestinal tract.

Food leaves the stomach after it has been disintegrated and in a more or less digested state, suspended in an acid liquid medium. In the duodenum it mixes with the secretion of the liver and the pancreas. Recent studies show that these secretions are always normally present in the duodenum in varying amounts,⁴ and that these amounts are greatly augmented after food enters the duodenum. The exact mechanism which stimulates the flow of bile and of pancreatic juice after food enters the duodenum is by no means fully established. But sufficient careful experimentation has been done to show that food or its digestion products play an important rôle.⁴

To the practising physician the important physiological facts are: (1) that the entrance of food into the duodenum is followed by stimulation of digestive secretions, and (2) that these digestive secretions are furnished by the pancreas and liver.

The pancreas has the dual function of supplying enzymes and alkali to the intestinal contents. The enzymes secreted by the pancreas are of three types: *i.e.*, trypsin, which digests proteins; lipase, which digests fats; and amylase, which digests starches. Physiologists claim the existence in the intestines of a long list of other enzymes, which they contend are manufactured in the mucous membrane of the intestines. Of all these, only one has been incontrovertibly established, and this one is called erepsin. Erepsin is a proteolytic enzyme, which is in all probability not secreted into the lumen of the intestines, but is confined to and acts within the cells of the intestinal mucous membranes.

Trypsin acts on proteins and peptones, and the various intermediate bodies formed by the action of pepsin, and tears them down to far simpler chemical substances called amino-acids. Amylase acts on the starch, or carbohydrate, part of food, out of which it makes sugar. Both the amino-acids and the sugar are absorbed into the portal venous system and pass directly to the liver. The lipase of the pancreatic juice makes fatty acids and glycerin out of the fat portion of food. The fatty acids combine with the calcium and sodium present in the intestinal lumen to form soaps. These soaps are soluble in the intestinal contents, and are absorbed as such by the lacteals of the intestinal walls. From there they pass into the thoracic duct, and thence into the blood stream.

For the efficient action of the pancreatic enzymes, certain physico-chemical conditions are necessary; *i.e.*, a lessening in the acidity of material coming from the stomach, and such mechanical preparation of the solid food that the enzymes can act readily on it. Acid material coming from the stomach is mixed in the duo-

denum with the alkaline liquid secreted by the pancreas, and the resulting neutralization which ensues varies from partial to complete.⁴ Often it is such that the contents of the duodenum are slightly acid; which apparently allows the continuation of the action of gastric pepsin, while it evidently does not prevent the action of the pancreatic trypsin.

It must be borne in mind that a great deal of the food taken into the stomach reaches the intestines in a solid state.⁴ In order that intestinal enzymes can act rapidly on this solid food, the latter must be broken up into fine particles, and these suspended in a relatively large amount of liquid medium; in other words, the greater the surface area of the solid food the quicker the enzymes will digest it. The trituration and suspension of solid food is accomplished by a combination of physical and chemical processes. These begin in the mouth, where mastication mechanically divides the food and mixes it with the mucus of the saliva. After reaching the stomach, the mechanical action of gastric peristalsis, together with the softening of food by the physical and chemical action of the gastric secretions, causes further disintegration of the solid food particles and their suspension in the liquid secreted by the stomach; the resulting mixture is called gastric chyme. On entering the duodenum, the gastric chyme is immediately mixed with the alkaline secretions of the pancreas and bile from the liver. These alkaline secretions, together with the high mucous content of the bile, furnish an excellent medium for maintaining in suspension the solid food particles of the gastric chyme. The medium contains, also, bile acids, which are secreted by the liver. With the aid of the bile acids, fats are emulsified, *i.e.*, they are suspended in a finely divided state, and this allows the fat-splitting enzyme, lipase, to act efficiently. The emulsification and digestion of the fats remove them from the surfaces of the protein and starchy food particles, which allows much more rapid and complete digestion of these parts of the food by their respective enzymes.

Physiologists claim the existence in the intestines of various enzymes and chemical entities other than those described above. Among these are trypsinogen, enterokinase, secretin, etc. But the actual existence of these bodies has not been fully proved, and the assumption of their existence is at present of no help in clinical medicine. For this reason they will not be discussed.

Thus, what is definitely known above intestinal digestion in man may be briefly summarized as follows:

The entrance of gastric chyme into the duodenum is followed by the flow of bile and of pancreatic juice. Alkaline fluid, secreted by the pancreas, more or less completely neutralizes acid material from the stomach. The mucilaginous consistency of duodenal contents, to-

gether with the bile acids, emulsifies fats and suspends solid particles of food, which permits rapid action on them of the digestive enzymes. These digestive enzymes are manufactured in the pancreas. One of them, trypsin, breaks up proteins to form amino-acids; another one, amylase, forms sugar out of starch; and another one, lipase, forms fatty acids out of fats. These end-products of digestion gain access to the body after they are absorbed by the intestinal walls. In addition, there exists a proteolytic enzyme, erepsin, within the epithelium of the intestinal mucous membrane, but the office of this enzyme remains problematical.

Physicians have attempted to make practical application of the known facts concerning the physiology of digestion, which have been discussed above. But such attempts have often been in vain; due, perhaps, to the lack of methods which would allow the findings in abnormal persons to be compared with those found in normal persons. Such methods would comprise, among others, those for determining whether the pancreas and the liver were each secreting normal types of material; that is, such methods would furnish indices to the functional state of these organs.

Because of the clinical importance of the above methods, the author and his co-workers undertook their development. Chemical methods have finally been devised which permit accurate estimation of the concentration of the enzymes of pancreatic juice, while other methods have been developed which allow quantitations of component parts of bile to be made. For these purposes, bile and pancreatic juice are readily obtained from the duodenum by means of the duodenal tube.

After developing the methods, experiments were made for the purpose of ascertaining what substances were best suited for stimulating the pancreas and the liver to secretory activity. These experiments showed that a large variety of substances, edible and otherwise, might stimulate the flow of pancreatic juice or of bile. It apparently made little difference whether the substances were ingested by mouth or were introduced directly into the duodenum through the duodenal tube. However, the only substances which were found to stimulate invariably the flow of both pancreatic juice and bile were adequate amounts of food.

The rapidity with which stimulation of the liver and pancreas occurred and the degree of stimulation were found to vary after the ingestion of different foodstuffs and substances of varying chemical and physical natures. Certain substances were found to produce very rapid stimulation of the liver or of the pancreas. Of these, cream seems the most suitable for use in the study of the pancreatic juice¹ of patients; while one suitable substance to stimulate the flow of bile is a solution of Epsom salts.²

As a result of studies on the pancreas, the estimations of pancreatic digestive function, as determined by enzymic concentrations of duodenal contents, has been given a fairly definite clinical status.¹⁰ Such studies are of broader application when combined with gross inspection of duodenal contents collected after introducing Epsom salts solution directly into the duodenum, so-called lavage of the duodenum. These contents are observed for the presence or absence of bile and for relatively large amounts of blood. The aid obtained from such studies of duodenal contents are of value in differentiating between benign and malignant cause for jaundice, in localizing the site of a lesion causing jaundice, in ascertaining the functional state of the pancreas during convalescence from acute pancreatitis, and in the diagnosis of chronic pancreatitis. The findings in the duodenal contents which are important aids in differentiating between benign and malignant causes for jaundice and in localizing the causative lesion may be outlined as follows:

1. Normal Enzymic Concentrations (normal pancreatic function): Normal enzymic concentrations and no visible bile after the first lavage with magnesium sulphate demonstrate that the site of the lesion is above the ampulla of Vater, and that it does not involve the head of the pancreas.

(a) If bile reappears after repeated lavage of the duodenum with magnesium sulphate solution, it is highly probable that the obstruction to the biliary tract is of benign character.

(b) If bile does not reappear after repeated lavage, the lesion is probably, but not necessarily, malignant.

2. Abnormal Enzymic Concentrations (abnormal pancreatic function):

(a) Abnormal enzymic concentrations, with the initial presence of bile or its reappearance after lavage of the duodenum with magnesium sulphate solution, suggest benign obstruction in the region of the ampulla of Vater. In such cases the reappearance of bile may be accompanied by increase in enzymic concentrations.

(b) Abnormal enzymic concentrations, when bile remains absent from the duodenum in spite of repeated lavage of the duodenum with magnesium sulphate, suggest cancer of the head of the pancreas.

(c) Duodenal contents grossly discolored with blood, containing no bile and abnormal enzymic concentrations, denote cancer involving the pancreas, common bile duct, and wall of the duodenum.

It will be emphasized that these findings are often not diagnostic in themselves, but they are diagnostic aids. By their use in selected cases diagnoses may be made before laparotomy, which otherwise could not be made until after operation.

Physiologists have established that in man normal bile contains various pigments. Of these, the most abundant one imparts a reddish-brown color and for this reason is called bilirubin. Physiologists have, also, established the presence in bile of chemical compounds which they have named the biliary acids, and of a substance known as cholesterol. These substances are familiar to all physicians. Cholesterol furnishes the greatest number of gallstones, while marked diminution in the amount of biliary acids entering the intestines is accompanied by loss of gross amounts of fat in the feces. Other than these well-known clinical facts, the physiology of the bile has been of little practical importance to the physician. But recently more intimate studies of the biliary fraction of duodenal contents have been made by a number of investigators.¹¹ The present author and his co-workers have added to the findings of these investigators by devising methods⁴ which permit the quantitation of the color of the bile present in duodenal contents, and of the concentrations of the bile pigments, biliary acids and cholesterol. Data have been accumulated which show that such quantitations furnish indices of the functional condition of the liver. These studies make it seem probable that the great majority of the bile which enters the duodenum has come directly and unchanged from the liver, and without passing through the gall-bladder. Studies on patients have demonstrated that such indices of liver function are of aid in the diagnosis of diseases of the liver and gall-bladder. Thus, physiology is again applied to advantage in the actual practice of medicine.

No dissertation on the chemistry of digestion is complete unless some mention is made of the action of the bacterial flora of the intestines. The intestines contain a wealth of bacteria, which are capable of manufacturing enzymes that can accomplish all that is done by those developed in the human digestive glands; and, in addition, these bacteria possess enzymes capable of carrying on processes which the enzymes of the human digestive organs cannot do. However, the study of the action of bacterial enzymes has been largely done *in vitro*, and the study of their chemical action within the intestines has proved to be a highly difficult and complicated matter. For this reason, what part bacteria actually play in the chemistry of either normal or abnormal digestion is extremely difficult to ascertain. Nevertheless, it is fair to state that bacteria unquestionably do bring about a great variety of chemical processes inside the intestinal lumen. Because of this, clinicians are prone to blame bacteria for a great number of illy understood conditions affecting man; this blame extends all the way from arteriosclerosis and old age to chronic arthritis. How much of it is correct is problematic. However, two important observations of the effects of bacteria on

digestive processes which have been fully established are: (1) in certain intestinal conditions the administration of *Bacillus acidophilus* and lactose produce amelioration of the patient's symptoms; and (2) putrefactive bacteria produce phenols in the colon. These phenols give rise to the well-known indican reaction in the urine. Of course, it is well established that bacteria are the direct cause of many pathological gastro-intestinal lesions; but this scarcely belongs to the subject under discussion.

In conclusion it will be emphasized that nothing in this paper is to be construed as criticizing the physiologist, bacteriologist, or other scientists. The object of this paper is to call your attention only to the well-established facts concerning chemical digestive processes in man, and how such facts may be used to advantage in the actual practice of medicine.

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TREATMENT OF NEUROSYPHILIS WITH SULPHARSPHENAMINE. A REPORT OF THIRTEEN CASES*

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FOR many years, extensive experimentation with various drugs in the treatment of neurosyphilis has yielded only meager results. Among the preparations used, the arsenic compounds, because of their more or less ease of penetrability into the cerebrospinal fluid, have remained the favorites as presenting hitherto the most likely instrument of attack against the spirochete of the central nervous system. Administration of the arsphenamines has required a somewhat specialized technique and has been accompanied by undesirable side actions with which we are all familiar. A recent arsenical sulpharsphenamine has, therefore, been employed in a beginning series of cases with a view to offering a more simple, safe, and, if possible, more effective treatment of neurosyphilis.

*Read before Norfolk District Medical Society, October 20, 1922.

REVIEW OF LITERATURE

Before reviewing results thus far noted, you will be interested to know something of the composition of this drug, its experimentation, and the technique of administration. Sulpharsphenamine is an arsenobenzene derivative, prepared from arsphenamine, formaldehyd, and sodium bisulphite. According to the method elaborated by Voegtlin and Johnson, of the U. S. P. H. Service, 1922, it differs from neoarsphenamine only in a side chain containing one additional atom of oxygen. Experimentation has demonstrated that the drug possesses great stability in dry form and solution. Whereas salvarsan and neosalvarsan both rapidly change color and composition on standing in solution, sulpharsphenamine remains clear and tests after twenty-four hours have shown no increase in toxicity. Its average arsenic content is 22 per cent., while that of arsphenamine is 30 per cent. Tests have indicated a much lower toxicity than arsphenamine and neoarsphenamine and a greater constancy in parasitocidal power. Voegtlin and Smith, 1921, and Voegtlin and Miller, 1922, found that different lots of neoarsphenamine displayed variations in activity as high as 300 per cent. The Surgeon General of the U. S. P. H. Service in a letter on April 26, 1922, to Medical Officers says, "Your attention is called to the fact that neoarsphenamine is a much less constant and less reliable preparation than arsphenamine. Not only do certain batches of all brands of neoarsphenamine show a tendency to deteriorate with age, frequently with definite increase of toxicity, but there is a pronounced irregularity in the therapeutic activity of different batches of neoarsphenamine regardless of the source of preparation. This variation may reach several hundred per cent. and as a result the physician may get a much less satisfactory therapeutic result than when arsphenamine is used, as the latter, regardless of brand or lot number, shows a more uniform therapeutic activity." Unlike these drugs, sulpharsphenamine was shown by Voegtlin to act more slowly, producing a maximum spirocheticidal effect only after three or four days instead of in twenty-four hours. This is cited as a theoretical advantage, inasmuch as the spirochetes may be under more or less constant influence in the interval between treatments.

Sulpharsphenamine was found to possess a peculiar ease of tissue penetration, being readily absorbed in subcutaneous tissues. Biologically it displayed practically the same percentage efficiency in its effect upon trypanosomes in the spinal fluid as tryparsamid (tryparsamid 87 per cent., sulpharsphenamine 82 per cent.), a drug now under experimentation by Lorenz of Wisconsin and others. Marked superiority to

arsphenamine and neoarsphenamine in this respect has been demonstrated.

In the use of tryparsamid temporary disturbances of vision have occurred, while with sulpharsphenamine no such phenomena have been observed.

Voegtlin (U. S. P. H. Reports, May, 1923), claims sulpharsphenamine as the most effective arsenobenzene derivative yet studied and states that greater therapeutic efficiency may be expected with large single doses at longer intervals. It is suggested that failure to complete sterilization of patients with advanced syphilis is due to the inability of arsphenamine and neoarsphenamine to reach the spirochete deeply embedded in the tissues of the brain and spinal cord. The superior effectiveness of sulpharsphenamine in penetrating the spinal fluid suggests a trial in neurosyphilis.

As to clinical results, reports are still few. A similar product, sulfarsenol, has found some success in France for the past three years, but its manufacture has been kept a trade secret. Doble (*Lancet*, July 31, 1920) believes the hypodermic method of administration to be ideal for infants and those with inaccessible veins. He had had no side effects, and usual complications did not seem to be as marked as in the case of other similar arsenicals. Later (*Lancet*, January 13, 1923), he praises sulpharsphenamine highly, saying, "It is the only one of the arsenobenzol compounds which can be given by injection into muscles or subcutaneous tissues without causing great pain." Results obtained with the drug have been uniformly good, comparing favorably with neosalvarsan. He has treated a number of cases that reacted badly to the other arsenicals and that have been refused treatment on account of dermatitis, jaundice, or other complications. He states that pregnant women can be treated right up to the birth of the child.

Powell, quoted by Voegtlin (P. H. Reports, November 10, 1922), states that one case of primary syphilis, in a sailor, treated with .4 gram sulpharsphenamine, showed complete disappearance of spirochetes from the chancre after twenty-four hours.

The clinical therapeutic test is the only reliable one and these treatments have been undertaken to assist in substantiating or rejecting any claims for superiority sulpharsphenamine may have in the treatment of neurosyphilis.

ADMINISTRATION

In this series the drug has been injected intravenously and intramuscularly with equal results. Ampoules, containing from .3 to .6 gram of a readily soluble, light yellowish powder are used, the dose being increased to a maximum of .6 gram, according to tolerance. Treatments are given once a week unless contraindications

should arise. For intravenous injections, a 3 per cent. solution of sulpharsphenamine in sterile water is employed; i.e., .1 gram sulpharsphenamine to 3 c.c. of water. For intramuscular injections a more highly concentrated solution is better tolerated; i.e., a 30 per cent. solution of .1 gram sulpharsphenamine to 3 c.c. of water. In the intravenous route any of the accessible veins of the arm may be selected. A 25 c.c. Luer syringe is convenient for injecting, a 22-gauge straight needle $1\frac{1}{2}$ inches long having been first established in the lumen of the vein. This allows the collection of a blood specimen before treatment. For the intramuscular route a 2 c.c. hypodermic syringe, with the same size needle as in the other method, is used. Deep intragluteal injections are made. One grain of mercury salicylate in oil is administered intramuscularly in the gluteal region four days following each sulpharsphenamine injection.

EFFECTS OF ADMINISTRATION

In fifty-one intravenous injections only two local reactions were noted. These consisted in a slight burning sensation, redness, and local oedema, which subsided in two or three days. They were due to the escape of a dilute solution into the subcutaneous tissues. For the comfort of the patient, it seems advisable to avoid any leaking outside of the vein. In fifty-one treatments by the intramuscular method there were no local reactions other than slight tenderness at the point of injection for one or two days. No undesirable local effects from the injections of mercury were noted.

Treatment was in no instance followed by a generalized reaction. Patients continued up and about wards or at work.

In regard to more remote effects, it is of interest to note that practically all cases developed after seven or eight treatments some symptoms of renal irritation, the urine showing slight traces of albumen, occasional hyaline casts and pus cells. Four, however, had shown occasional pus cells on the initial urine examinations. One patient, S. B., after seven treatments displayed a slight trace of Benedict's reducing substance in the urine. Whether these conditions may be attributed to the sulpharsphenamine, the mercury, or both, is difficult to determine at present. It seems highly possible that treatment may have been too intensive. In this series doses of .6 gram have been regularly used, whereas .4 gram is the recommended average dose. Further investigation may yield more information on the subject. Voegtlin in his reports (November 10, 1922, and May 11, 1923) does not mention any irritative effect of sulpharsphenamine upon the kidney. One case, T. S., who lost the vision of his left eye, two years ago, through luetic optic nerve atrophy, and now displays an external strabismus of that

eye, on October 14, ten days following the eighth treatment, developed a severe conjunctivitis and what is thought to be an iritis of the right eye. This patient is later mentioned as having shown negative blood and doubtful spinal fluid Wassermann reactions. This condition is difficult to explain. Following treatment it may be ascribed to the so-called mobilization of spirochetes which are invading tissues evidently the site of predilection in an earlier stage of the disease. Voegtlin reports that no nervous manifestations have been observed with any of the arsenobenzene derivatives.

DISCUSSION OF CASES

There are at present thirteen cases in this series and it must be remarked before reviewing the findings that a comparatively small number of treatments in each case have been given. Any conclusions as to the ultimate outcome, therefore, must be largely speculative.

Twelve cases present all the physical, mental, and serological characteristics of general paralysis, while one whose spinal fluid picture is atypical, showing only a positive Wassermann and slight protein reactions, is classified as psychosis with cerebrospinal syphilis.

Of the thirteen patients six were given intravenous and seven intramuscular treatments. A clinical record of each case was kept under the following headings: Date of Treatment; Amount of Drug; Method of Administration; Physical Examination, including weight; Routine Urine Examination; Mental Examination; Wassermann on the Serum; Spinal Fluid Examination, including Wassermann, description of fluid, number of cells, globulin, albumen, and colloidal gold curve.

In all but two cases treatment was continued weekly from August 23, 1923, to October 4, 1923. In all but two cases eight treatments have been given. These two have had seven.

Wassermann examination of the serum has been made weekly. The first spinal fluid examination following the initial one was made after five treatments.

Practically all cases have shown some slight physical improvement. Nine have shown increases in weight from three to nineteen pounds. Mentally there has been as yet no marked change. A few of the agitated have become more tractable and require less supervision, but this disease is subject to such variations in its untreated course.

Inasmuch as the changes thus far have been chiefly in the blood and spinal fluid we will interest ourselves in that direction. The diagnostic standards in the order usually affected by treatment are cells, globulin and albumen, Wassermann on the serum, Wassermann on the spinal fluid (Kaplan, *Serology of the Nervous and Mental Diseases*, page 138). A normal

spinal fluid is clear, Wassermann negative, has a cell count of 8 to 10 per c.m., negative globulin and albumen reactions, and a negative colloidal gold curve, characterized diagrammatically by 10 O's. One case, T. S., after seven treatments (See Table I) produced a doubtful reaction of

Inasmuch as cells, globulin and albumen, and the character of the gold curve, may depend upon the degree of meningeal irritation, any increase in negativity of these standards suggests a toxic influence of the drug upon the causative factors, the spirochetes. (See Table II.)

TABLE I
Serology of Treated Cases

Name	Number of Treatments	Method*	Wassermann on Serum	Wassermann on Spinal Fluid	Cells	Globulin	Albumen	Colloidal Gold	Test
A.A.	8	V	+	+	37	3	3	5553322000	Initial
			+	+	4	3	3	5543311000	Last
			+	+	73	4	3	5554430000	Initial
S.B.	8	M	+	+	2	1	1	5432110000	Last
			+	+	60	2	1	5533210000	Initial
G.D.	8	M	+	+	10	2	2	5533210000	Last
			+	+	59	3	3+	5555544200	Initial
G.F.	8	V	+	+	10	2	2	5431100000	Last
			+	+	77	4	4	5555555440	Initial
F.J.	7	M	+	+	14	3	3	5554433210	Last
			+	+	25	3	4	5555544430	Initial
A.L.	8	V	+	+	5	2	2	5543321000	Last
			+	+	111	3+	3	5555511000	Initial
J.M.	8	V	+	+	5	2	2	5443211000	Last
			+	+	24	2	3	5554433000	Initial
B.M.	8	V	+	+	4	2	2+	5544332000	Last
			+	+	94	4	4	5555554321	Initial
W.M.	7	V	+	+	8	2	2+	5432111000	Last
			+	+	0	0	2	0000000000	Initial
E.M.	8	M	+	0	4	1	1	0000000000	Last
			+	+	71	3	2	3554443000	Initial
G.R.	8	M	+	+	17	2	2	4311±10000	Last
			+	+	70	3	3	4555444000	Initial
T.S.	8	M	0	±	8	2	2+	5432111000	Last
			+	+	47	3	3	5554430000	Initial
N.V.	8	M	+	+	6	2	2	5543100000	Last

* V = intravenous

M = intramuscular

the spinal fluid Wassermann and a negative Wassermann on the blood reported on the same date. One other case, G. D., after the fifth treatment, gave a negative blood Wassermann which became doubtful the next week and was returned positive after the seventh treatment. A recent report was again doubtful. E. M., the case of cerebrospinal lues, produced a negative spinal fluid Wassermann upon the last test. All other blood and spinal fluid Wassermann reactions remained positive. In twelve cases, i.e., all cases of general paralysis, cells have shown a marked decrease, all except two falling within the normal limit or upon the border line. Ten cases, all general paralytics, have shown a decrease in globulin and albumen. In ten of the twelve cases of general paralysis there have been changes in the colloidal gold curves which were all of the so-called parietic type, ex. 5554432100, this alteration consisting in either an increase in O's at the right or, we may say, negative end of the curve, or a slight reduction in the height of the curve at the right extremity.

TABLE II

Summary of Treated Cases

Cases	13
General Paralysis	12
Psychosis with Cerebrospinal Syphilis 1	
Treatments	102
Intravenous	51
Intramuscular	51
Treatments in Each Case:	
Eleven Cases	8
Two Cases	7
Physically Improved	9
Mentally Improved	4
Blood Wassermann Reduced	2
Negative	1
Doubtful	1
Blood Wassermann Not Reduced	11
Spinal Fluid Wassermann Reduced	2
Negative	1
Doubtful	1
Spinal Fluid Wassermann Not Reduced	11
Cells Reduced	12
Ten or Below	10
Above Ten	2
Reduction in Globulin and Albumen	10
Reduction in Gold Curve	10

Many investigators have been able to produce similar changes in selected cases by the use of arsphenamine and nearsphenamine. In a recent series of treatments reviewed (Mills and Vaux, *Archives of Neurology and Psychiatry*, April, 1923, see Table III), the effects have not

V. The production of glycosuria in one case also does not permit satisfactory explanation at this time.

VI. An acute iritis in one case may be due indirectly to treatment but it seems hardly fair to base any conclusion on one case.

TABLE III

Cases of Neurosyphilis

Case	First Test			Final Test			Months Observed
	Blood	Spinal Fluid	Cells	Blood	Spinal Fluid	Cells	
1	++++	++++	50	+	++	18	5
2	—	++	10	—	++++	1	21
3	++	+	65	...	++++	50	23
4	++++	++++	318	++	—	28	22
5	++++	++++	1	+	...	...	29
6	++++	—	39	++++	...	...	15
7	++++	++++	76	++++	...	...	6
8	++	++++	63	++++	++++	12	24
9	++	—	43	++	—	9	18
10	++++	—	2	+++	—	0	11
11	++	++++	22	—	...	...	24
12	+	++++	196	+	++	14	26
13	+	++++	77	++++	++++	20	18
14	++++	++++	...	+++	15
15	±	++++	70	...	...	...	13

Note: Treatment of general paralysis was undertaken only for special reasons:

- Those thought to have early or tabetic type with brain involvement.
- Those who had previously received intensive treatment.
- Those whose relatives insisted on treatment.

Three courses of treatment were given.

seemed as uniform or as rapid. With tryparsamid, however, Lorenz (*J. A. M. A.*, May 26, 1923) reports fairly rapid and consistent improvement mentally, physically, and serologically.

It cannot be predicted at this time what further influence more prolonged treatment may have upon the serum and spinal fluid Wassermann reactions.

CONCLUSION

Because of the incompleteness of the series, definite conclusions as to the advantages of sulpharsphenamine over other well-known arsenicals cannot be drawn at this time. However, with the data at hand several suggestions seem justifiable:

I. Sulpharsphenamine is extremely simple of preparation and administration.

II. It has a comparative freedom from local and general reactions.

III. It may be administered intramuscularly without ill effects. This is advantageous where veins are inaccessible and seems as effective as treatment by the intravenous method.

IV. The symptoms of renal irritation following several treatments are not satisfactorily explained. They may be due to excessive dosage or a cumulative toxic effect upon the kidney. This should have further investigation.

VII. Thus far the spinal fluid changes compare favorably with those produced by the arsphenamines. There seems to be a certain uniformity and rapidity of alteration of diagnostic standards in advanced, unselected cases which have not been noted with other forms of treatment. This may indicate a greater toxicity of sulpharsphenamine for the spirochetes of the central nervous system.

VIII. Practically all in this series are cases of advanced neurosyphilis. Treatment in early cases may show more striking therapeutic effects.

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China with four hundred million people has only ten thousand registered doctors. Most modern nations have one doctor for each thousand of the population. Japan has over sixty thousand for her fifty-five million inhabitants.

THE EARLY RECOGNITION OF CLINICAL CHRONIC PULMONARY TUBERCULOSIS IN THE ADULT

BY DAVID ZACKS, M.D., MIDDLETON, MASS.

AN enormous literature has accumulated on chronic pulmonary tuberculosis. These facts are known: The etiology is the tubercle bacillus. The majority of tuberculous infections take place in childhood. The majority of the white human race are infected. The tuberculin test is specific. About 7 per cent. of the population develop clinical disease and, in the United States, 140,000 died of this disease in 1922. This mortality is about half of what it was 50 years ago.

The most characteristic clinical feature of this disease is its tendency to remissions. A great many who develop clinical tuberculosis tend to spontaneous arrest; some even without the accepted rational treatment or, indeed, without a knowledge that the disease ever existed. The most favorable time for treatment is early in the development of clinical tuberculosis. This early recognition is still of utmost importance, and constant reiteration is still necessary. Since the opening of the Essex County Sanatorium in May, 1921, to July, 1923, there were admitted 602 different individuals; only 42 (6.97 per cent.)* of these, however, were classified as minimal or incipient tuberculosis.

The sanatorium physician sees a comparatively small number of incipient cases. The specialists have blamed the general practitioner for this situation. Dr. Pattison says the reason the general practitioner does not make an early diagnosis is that he is careless. Dr. Pottenger states that the general practitioner can make a diagnosis of tuberculosis in 80 per cent. of the cases he sees if he will take the time to ascertain and analyze the clinical history and make a physical examination according to his ability. Again, he states that the general apathy of the profession toward tuberculosis and neglect to study it, as its seriousness and frequency deserve, leads to a lack of confidence in their ability to diagnose and treat it satisfactorily. Dr. Stoll states that the chief reason for this failure to recognize early tuberculosis is not so much ignorance as to what the signs are, as to lack of knowledge how to elicit them. Dr. Barnes finds the reason twofold: In the first place, the patient does not seek the advice of the physician early enough and, in the second place, the physician does not recognize the disease early enough. Our own statistics in this connection are significant. Only 46.6 per cent. of our series went to see their physician within one to three months of the onset of disease, and 59 per cent. received a correct diagnosis within one to three months after such

*There were far advanced, 52.65%; moderately advanced, 36.54%; incipient, 6.97%; non-tuberculous, 2.65%, and non-clinical pulmonary tuberculosis, 1.16%.

consultation. Roughly speaking, only one-half of our cases consulted a physician early enough; three-fifths, however, received their diagnosis correctly. It is admitted that two months is a reasonable time in which to diagnosticate a doubtful case.

If we study our statistics from a different angle, we find that about 31 per cent. of the incipient cases did not receive a correct diagnosis until 24 months after onset of the initial symptoms. It is not at all surprising that this is so. Dr. Brown states that, curiously enough, the diagnosis grows more difficult as knowledge of disease advances. It is true that in some doubtful cases the closest observation is necessary for a sufficiently long period, together with frequent physical examinations, x-ray study, frequent sputum examinations and, it may be, the subcutaneous tuberculin test. Even then, we may not be able to either affirm or deny the diagnosis. These cases we classify as non-clinical pulmonary tuberculosis. The point is, that this difficult group of cases must not be dismissed lightly by telling them that they have weak lungs, and suggest exercise to strengthen them; that they have nervous indigestion; a general run-down condition; or, worse yet, that nothing is the matter, and give them a tonic. Our records show that the patient is usually not satisfied with this kind of vague diagnosis. He is apt to consult a second physician, or a third, or, it may be, a specialist suggested by a friend and, finally, learn the truth. It should be the aim to tell the patient our suspicions and outline to him what we propose to prove or disprove. Then, if the patient is unwilling to accept our advice, or unwilling to face the diagnosis, he alone will be to blame.

Dr. Elsner avers that to wait for definite physical signs in tuberculosis before making a diagnosis darkens prognosis, for the patient's chances are reduced thereby. To anticipate the final development in cases which are strongly suggestive adds to the patient's chances. Positive physical signs are never early evidence of lung infection; they mean that the case is advanced.

It is clear, then, that in order to give our patient the best chance for recovery or permanent arrest, we must not wait for definite signs or tubercle bacilli in the sputum before making a diagnosis; rather are we to anticipate the final development in cases which are strongly suggestive. In doing this, we must not be too sanguine, however, for it is just as blameworthy to label our patient tuberculous when the disease does not exist as it is praiseworthy to make an early diagnosis. What, if any, are the symptoms and signs we are to heed in order to make the diagnosis early?

There is no pathognomonic sign except tubercle bacilli in the sputum. Indeed, other signs have been described from time to time, purport-

ing to be of assistance. We find them of doubtful value: Sharp breathing (Turban), interrupted breathing, prolonged expiratory murmur, broncho-vesicular breathing of the first type (Cabot), murmurs over the subclavian artery (Stokes), the ulnar reflex (McCarthy), the red line on gums (Thompson), dilatation of the pupil on the affected side (Brown), myoidema, Chvostek's phenomenon. These, when present, are of academic interest only and of no practical importance. The complement-fixation test, the agglutination test and opsonic index are elaborate procedures and of doubtful value. The more recent auto-urine test of Wildbolz is in the experimental stage and is, at present, used mostly abroad.

In the majority of the cases the diagnosis can be made from a correct evaluation of the data obtained by a careful history, physical examination, and stereoscopic x-ray shadow. In some very doubtful cases, without physical signs or leading symptoms, the subcutaneous tuberculin test may be necessary.

The history is of greatest importance, and should be a recital of health events, with dates if possible, from childhood to present illness. Prolonged contact in childhood is important, so are measles and whooping-cough, especially when accompanied by broncho-pneumonia. Adult exposure, though reported, is rare, and must be prolonged and continuous to be of any significance. Influenza and pneumonias are considered predisposing* (Brown, Baldwin, Turban, Jacob, and Pannwitz). Acute and chronic bronchitis, however, asthma, malaria, typhoid fever, and pleurisy (wet or dry) are symptomatic of existing disease rather than causative diseases (Baldwin, Brown, Turban, Miller, Soca, Lindsay, West, Fishberg, Norris and Landis). Ischio-rectal abscess or fistula in ano, pleurisy with effusion, chronic purulent otitis media, tuberculous cervical adenitis, and osseous tuberculosis may precede pulmonary symptoms by years. Loomis found that three and one-half years may elapse between the first attack of pleurisy and actual development of pulmonary disease. It is of interest to note that in the past histories of the tuberculous, "rheumatism" and chorea are conspicuous by their absence. When these occurred, we have found cardiac disease rather than active pulmonary tuberculosis.

Of physical signs, two, in our opinion, stand out as the most important. These are increased whispered voice conduction and râles persisting in the upper chest. Dr. L. Brown describes the typical râles of pulmonary tuberculosis as moderately coarse. It is important to know how to best elicit these râles. They may not be heard until the patient is told to cough. If cough does not bring out suspected râles, have patient breathe out half or nearly all of his breath; then cough and inhale sharply. Râles will ap-

pear, if present, on the rather hurried inspiration following this cough.

The symptoms may be classified, for convenience of study, into general and local. The local symptoms may be produced reflexly.

The general symptoms are: Loss of weight; lack of endurance; slight fever (99°F. men, 99.5°F. women); rapid pulse; night sweats.

The local symptoms in order of their importance are: Tubercle bacilli in the sputum; râles persisting in the upper chest; x-ray shadow in the parenchyma of the upper chest; hemoptysis; pleurisy (so-called idiopathic, dry or wet); cough with expectoration; hoarseness; subcutaneous tuberculin test reacting typically.

If a patient presents a symptom-complex of one or more of these local symptoms, together with one or more of the general symptoms, he will fall in one of these groups:

1. Tuberculous.
 2. Possibly tuberculous.
 3. Non-clinical pulmonary tuberculosis.
 4. Non-tuberculous (symptoms and signs explained by some other disease).
1. Tuberculous.
 - a. Tubercle bacilli in sputum (2 tests) with or without symptoms or physical signs.
 - b. History of hemoptysis with either râles persisting in upper chest or an x-ray shadow in the parenchyma of the upper lung field.
 - c. History of pleurisy (dry or wet) with either râles or x-ray shadow as in "b."
 - d. History of indefinite symptoms and signs which, in the physician's opinion, justifies the use of a moderate dose of tuberculin subcutaneously and reacting typically.
 2. Possibly tuberculous.
 - a. History of blood-spitting.
 - b. History of pleurisy (so-called idiopathic, dry or wet).
 - c. History of cough with expectoration for several weeks.
 - d. History of either unexplained loss of weight, lack of endurance, slight fever, slight acceleration and instability of pulse; hoarseness, indigestion, night sweats.

On a patient presenting a history of any one or a combination of these symptoms, an absolute diagnosis cannot be made. The patient should be under strict observation and a search made for confirmatory evidence, such as tubercle bacilli in the sputum, persistent râles in the upper chest, x-ray shadow or tuberculin test, in absence of all other confirmatory signs.

3. Non-clinical pulmonary tuberculosis.

This group is a difficult one in that one can neither affirm nor deny that the patient is tuberculous, once the question has been raised. Care-

*Fishberg does not regard influenza predisposing.

ful study will determine whether there is clinical evidence of any disease and, more particularly, if that disease is tuberculosis. If the history and the physical examination prove negative, if the x-ray and repeated sputum examinations (concentrated, if necessary) are negative, we give a course in diagnostic tuberculin subcutaneously. If the test is negative, we dismiss the case at once as non-clinical pulmonary tuberculosis. If the test is positive under the conditions given above, the patient cannot be declared to have clinical tuberculosis unless there is a focal reaction in addition to the general reaction. In such an event, further careful and prolonged observation is necessary.

4. Non-tuberculous.

Symptoms and signs are explained by some other disease. In this group are diseases which must be considered in a differential diagnosis of pulmonary tuberculosis and excluded. Those which simulate tuberculosis are chronic endocarditis (especially mitral disease), pernicious anemia, exophthalmic goiter, influenza, bronchiectasis, pleurisy with effusion, abscess, tumor, pulmonary infarction, chronic empyema, gangrene, and such parasitic diseases as actinomycosis. Pulmonary tuberculosis may simulate malaria, typhoid fever, nervous dyspepsia, chlorosis, neurasthenia, bronchitis, influenza, idiopathic pleurisy, asthma, acute and chronic pneumonia.

SUMMARY AND CONCLUSION

There is still need for greater effort to recognize chronic pulmonary tuberculosis early. Only 7 per cent. of the patients admitted to the Essex County Sanatorium are in the incipient stage. This also holds true for the other county institutions and the Rutland State Sanatorium. Many patients do not seek the doctor's advice early enough, but 31 per cent. of our minimal cases did not receive a correct diagnosis until 24 months after the initial symptoms appeared. Ninety per cent. of the early cases came to the Sanatorium within one to three months after the diagnosis was made.

In a protean disease like tuberculosis, which may simulate and be simulated by so many other diseases, a diagnosis may not always be as easy as some would think, nor as difficult as others would lead us to believe. A majority of the diagnoses can be correctly made by any physician able and willing to take an accurate history and do a physical examination according to his ability. Sixty per cent. of our cases were so diagnosed. The physician will do well to heed the points in the past history,—the general and local symptoms given above. In doubtful cases, he must not forget the diagnostic aids at his disposal, such as repeated sputum examination, x-ray and the chest consultant. Subcutaneous tuberculin should not be given by those who have had no experience with the test.

In regard to hemoptysis, we mean blood-spitting of a dram or more, especially significant when followed by streaking for a day or two. All are not in accord with the view that blood-spitting in this sense means clinical tuberculosis requiring treatment. We believe, in the light of our case histories, that to minimize the importance of blood-spitting is as inexcusable a practice as to lull the patient into a false security by telling him that there is nothing the matter; that he is just in a run-down condition or has weak lungs, while waiting for absolutely incontrovertible physical signs, and bacilli to appear in the sputum.

The stereoscopic x-ray, we believe, is of great aid in diagnosis, second only to positive sputum and râles. When the physical signs and history were positive in the sense outlined in this paper, we found that the x-ray shadow was positive in 65 per cent. and failed in 35 per cent. (Sampson and Heise—77 per cent. positive, 23 per cent. failed). When the history was negative and physical signs positive, we found the x-ray shadow 85.7 per cent. positive and 14.3 per cent. failed (Sampson and Heise—50 per cent.—50 per cent.). When the history is positive and the physical signs negative, the x-ray was found positive in 53.3 per cent. and failed in 46.7 per cent. (Sampson and Heise; positive 60 per cent., failed 40 per cent.). When both history and physical signs were negative, Sampson and Heise found the x-ray shadow positive in 42 per cent. and negative in 58 per cent. Tuberculosis should never be excluded without an x-ray study.

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THE RUTLAND BOARD OF TRUSTEES*

BY ARTHUR K. STONE, M.D., FRAMINGHAM
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I HAVE been asked to be present and give you greetings because I was the last Chairman of the Board of Trustees before it was finally abolished by act of legislature. At that time I was, however, the member with the shortest term of service on the Board. Judge Hammond, the first Chairman and staunch friend of Rutland, should have been the speaker. The work I had to do was simply to carry on measures that the Board had already inaugurated.

The Commonwealth of Massachusetts, and especially the patients and their friends, are to be congratulated that the inauguration of this unusual venture into State medicine was entrusted to trustees of such broad vision, to a board represented by business men and lawyers, for the consideration of economic questions, and the patients' welfare, represented by men of the medical profession, whose foremost idea was the benefit of the patient.

It was a new departure and experiment, and many conflicting ideas had to be considered. It is always to be remembered in the case of the unfortunate victims of tuberculosis or mental disease that there is no royal road to recovery; no surgical operation with a quick return to health; no specific cure; but, on the contrary, that we are ever groping in the dark for means to overcome the enemy. What seems well assured today may be found to have grave limitations in the light of longer experience. I need only to mention the matter of extra feeding on which so much stress was put at one time, now realized to be a matter which must be used with greatest care, or harm, rather than good, may result.

In the very outset, the new trustees pointed out that the duty of the State was to educate, as well as care for and arrest the early-stage tuberculosis patient; while the care of the advanced case was an ordinary hospital problem and should be undertaken by well-equipped hospitals near the patient's home. This, to my mind, is true today.

Another step taken by the Board of Trustees was to obtain from that wise Attorney General, and later Judge, Hosea M. Knowlton, an opinion that "the hospital is not a pauper institution," but he continued "It is a public charity. I think it is the intention of the legislature to authorize their care without subjecting the patients to the stigma of pauperism." This important opinion, which was later embodied in actual statute, fixed for all time and throughout the country the status of tuberculosis patients in public institutions.

The trustees recognized the need of recreation

*Read at the meeting in Rutland commemorating the 25th anniversary of the opening of the Rutland Sanatorium.

and entertainment for the patients and, according to Massachusetts traditions, a library was given to Rutland and this assembly hall was soon called for and built.

The trustees also realized that physicians isolated in an institution were apt to go stale unless they had direct contact with other men doing the same or similar work, and hence the physicians were urged to attend conferences such as this one, even when the meeting was held outside of the State. The trustees believed that such expenditure was for the best interests of the patients under the care of the physicians, and not in the nature of a junket. Waste and extravagance of public funds are always to be deprecated, but it is an unwise economy which causes mental starvation and never makes for efficiency.

In looking over the records of the trustees I find a number of wise recommendations which have never as yet been accepted by the money-granting bodies. When the Board of Trustees finally went out of office it had for each institution a program which it was estimated would take at least five years to complete. Most of these, I am glad to say, have been carried out.

Trustees often had amusing experiences with the Legislature, which passed statutes that required expenditure on the part of the trustees, but when the case was presented to the holders of the purse strings there was no unloosening of the same. The most notorious example is the statute regarding the proper protection of public records. When the trustees, in compliance with the law, presented plans and asked for funds for fire-proof vaults, they were laughingly told to "pass it." More than ten years have passed and the law is not obeyed by the State that made it.

The trustees early, and throughout their existence, established the fact that Rutland, and later all the other sanatoria, was for the benefit of all the persons of the Commonwealth, who had the misfortune to have tuberculosis, and not for the friends of a favored few. It took courage on the part of John B. Hawes, the Secretary, to make this realized by everybody, as even governors had to be educated.

In their attempts to carry out their established policy, the trustees were not always supported by the money-granting powers. The leading members of the Committees of the Legislature on Public Institutions were always appreciative of the problems of the trustees and helpful with constructive suggestions. They knew the institutions at first hand from personal visits and inspections, but their recommendations did not always carry weight with men who never left the State House.

One governor so far misconceived the duties of his office that he sent an emissary with the instructions to "get something on the institutions," rather than what he should have said—

"Go to the institutions and see if you can make any suggestions which will help my trustees to do better by the patients under their care."

Another governor, at a hearing of vital importance to this institution, showed his great interest by gently falling asleep.

No governor, and only one group from the Council, visited any sanatoria during the years of my office holding. The councilor, who realized the duties of his office, was the same man who recently refused a raise in salary in a public office held by him. But I must admit that even his point of view was rather that of a fault-finder than as a helpful critic. It is not to be wondered at that the trustees were sometimes criticized by men who did not know conditions.

Such were some of the difficulties of the trustees. They were pioneers in an unexplored country. The work which the trustees inaugurated in the actual care of the patients was the education of both physicians and the public to the fact that tuberculosis taken in its early stages can be arrested, that it is a contagious disease and consequently its spread can be diminished by the segregation of the sick. (In this they have been greatly aided by the private associations which have come into being, notably the Boston Tuberculosis Association.) This pioneer work of the Rutland Sanatorium, and later at the other sanatoria, has had its part in the reduction of the mortality from tuberculosis from 137 when Rutland opened to 80.5, the mortality rate of last year (1922).

The experiment has paid, both in lives prolonged and restored to health, and in sickness and death prevented.

I will only mention a few names from those who have held office. First, the man with vision—Dr. Alfred Worcester, of Waltham; Judge John W. Hammond, of Northampton, Chairman of the Rutland Board throughout its existence, and wise friend of this institution; Mrs. Sylvia B. Knowlton, who was appointed upon the board in 1905, and served continuously with devoted interest until the board was abolished in 1923; Arthur T. Cabot, who gave up one of the most successful and lucrative surgical practices in the State to take up the even more important work of public health, acting as Chairman from the reorganization, as the Board of Trustees of Hospitals for Consumptives, in 1910, until his death; Daniel L. Prendergast, several times Chairman, and friend of everybody, who was always ready to give out of his busy life time for the benefit of the patients; Walter C. Bailey, for a few years an interested Chairman, who made many wise suggestions; Dr. Albert C. Getchell, who for many years gave professional services to this institution.

All these, and many others, too numerous to mention, ever held themselves ready to give time and advice out of their business, legal or

medical knowledge, at the call of the Chairman of the Board of Trustees or any of the superintendents.

In the name of them all, who have labored in the past, I give you God-speed for greater accomplishments in the future!

Book Reviews

Youngken's "Pharmaceutical Botany." Fourth edition, revised and enlarged; 263 illustrations and a glossary. 12mo, xix, 538 pages. Cloth, \$4.00. By H. W. YOUNGKEN, M.S., Ph.D., Professor of Botany, Pharmacognosy and Materia Medica, Massachusetts College of Pharmacy; author of "A Textbook of Pharmacognosy." Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street.

The study of botany, which formerly occupied such an important place in the curriculum of the medical school, has been crowded out; scant attention is given to it in the pre-medical schools. Yet a cursory examination of such a book as the present one shows how many points of contact the physician has with this subject: his most important drugs are still obtained from the "vegetable kingdom"; the most important diseases which he has to combat are due to one class of plants (bacteria); plants are also involved in many minor ailments (hay-fever, dermatoses, etc.) as well as in poisoning (mushrooms, water hemlock, etc.).

Such a book as that of Youngken (which is now in its fourth edition) gives the physician interesting and valuable information as to the plants from which drugs are derived, those which are poisonous, methods for detecting poison, and starch grains of various origins, etc.

The book is written primarily for college and pharmacy students; special attention is not devoted to those subjects in which medical men are at present chiefly interested; experience, however, has so often shown that what appears to be of purely "academic" interest one day may soon become of great "practical" importance; that it is wise for a physician to be at least familiar with sources of information on such an important subject as botany.

Rockefeller Institute for Medical Research.
Reprints, vol. 46, pp. 684, 1923.

The busy practitioner cannot be urged to examine these studies, despite the splendid reputation of the Institute and the elaborate perfection of the papers. Even such a guarantee presumably seldom catches readers. Papers get read either for the sake of the writer or the subject, and if not seen in the original journals are

far more satisfactory as separate reprints, so that they can be filed by author or title. Furthermore, these studies cause one to regret the cost of their publication, reprinting as they do articles already set up for a variety of journals; reprints from these collected and bound would seem as useful and less extravagant.

The Treatment of Diabetes Mellitus. With observations based upon three thousand cases. By ELLIOTT P. JOSLIN, M.D. Third edition. Pp. 784. Philadelphia and New York: Lea & Febiger.

The most noteworthy changes in this new edition are best recorded in the words of the author's preface.

"The insulin section is obviously new, and partly for that reason, partly for convenience, and partly because of its importance is placed first; the table of contents outlines its major parts, while its diffusion throughout the book may be traced by the index. New also are the sections on pathology, respiration, metabolism, levulose, duodenal ulcer, diabetes of twenty years' duration, the Newburgh and Marsh methods, and the modern conceptions of acidosis. Dr. E. M. Bailey's tables of diabetic and non-diabetic foods have no counterpart. They represent a gift from the Connecticut Agricultural Experimental Station in New Haven. The Harris and Benedict tables for predicting the metabolism are added and are so clear that he who runs may read. The technic of treatment with the diabetic creed and the test and maintenance diets are the outgrowth of the war, which forced simplicity of management and the convictions that the hope for the diabetic lies in the general practitioner's adoption of the principles of diet."

The section on insulin is as thorough and complete as it is possible to have it at the present time. There is much of interest to be found in the description of Banting and Best's discovery of insulin, and the early work of the Toronto School. Of particular value to the practicing physician is the section concerned with the use of insulin in the treatment of diabetic patients. Here the dosage, the standard unit, and the method and technique of administration are fully and simply described. Specific directions for the use of insulin in the home are given, with both the doctor and patient in view. The dangers of careless administration of the drug are pointed out and many safeguards described. The fact that treatment *with* insulin demands even more accurate management of diets than treatment *without* it is stressed. A careful reading of this section should equip any practicing physician with the knowledge necessary to treat diabetics with the new drug intelligently. The section on surgery in diabetics has

been amplified and many interesting cases are reported.

"Suggestion" and Common Sense. By R. ALLAN BENNETT, M.D., M.R.C.P. Pp. 105. New York: William Wood & Company. 1923.

This small volume is written in clear and lucid English, but it is very elementary and conventional and, on the whole, rather superficial. With the exception of suggestive therapeutics, the author appears to be sort of a therapeutic nihilist. He is, however, a strong advocate of the influence of the mind over the body, for which he uses the much-abused, the little-understood and talismanic term, "suggestion."

The references to psychoanalysis in this volume are inaccurate and misleading, for instance in such a statement (p. 61) as "Analysis revealed no resistant complex in her unconscious mind," or (p. 67) that the object of psychoanalysis is the discovery of some sexual injury or adventure. In reply to such statements we may state that no properly trained analyst looks for complexes, that psychical sport being limited to the popular purveyors of psychoanalytical literature, and as for sexual injuries or adventures, such pornographic search belongs to the miasmatic narratives of the sex novel, and is never deliberately sought for by the competent analyst. The author makes no reference to the important part played by the transference in the cure of a nervous illness.

He emphasizes that suggestion is logical, but nothing is more illogical and ill-directed than the phraseology used in the suggestion which differs from the jargon of the primitive medicine man only in being a little more sophisticated and intellectualized. One of the most interesting features of the book is a plea for medical psychology to become a part of the medical student's regular curriculum, and it is to be hoped that when such a course is definitely established, suggestion will be given its correct historical setting as a remnant of primitive medicine.

Clinical Diagnosis by Laboratory Methods. By JAMES CAMPBELL TODD, M.D. (Colorado). Fifth edition, revised, enlarged and reset. Philadelphia and London: W. B. Saunders Co. 1923.

The fifth edition of Todd's book is more comprehensive than its predecessors. The author is to be congratulated for having covered his subject comprehensively but concisely. The text is sound and up to date. Although there are 762 pages, the book is not large. The paper and printing are excellent. This work can safely be recommended as a book of reference to physicians or as a manual for students.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN
WEEKLY CLINICO-PATHOLOGICAL EXERCISES.

EDITED BY
RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.
F. M. PAINTER, ASSISTANT EDITOR

CASE 10021

First entry. An English housewife of fifty-one entered March 24 for relief of generalized itching and burning of the skin.

F. H. Unimportant as far as known.

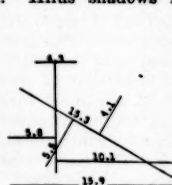
P. H. She had always had good health. She had measles, scarlatina, and whooping cough when a child. She had one miscarriage before the birth of a healthy daughter. The summer before admission she had an attack of furunculosis of the thighs and abdomen.

P. I. Five years before admission she noticed an area of dusky erythema over the chest, smooth, and "apparently under the skin." Similar areas of various sizes appeared until the entire body was covered. The lesions itched and burned extremely. A week later the erythema began to subside and the skin to peel off in great quantities. This erythema recurred many times during the winter, disappearing completely in spring and summer. The skin under her knees would crack, ooze, and finally crust, paining her very much. This condition of the skin had occurred every winter since the onset, growing progressively worse. External and internal treatments from a number of doctors and at the Out-Patient Department of this hospital, where she made four visits in February and March, gave only temporary relief. During the past winter the attacks had been worse than ever, the itching and burning so severe as to prevent her getting much sleep, causing mental fatigue and "nervousness." She had lost forty pounds since October. During the past few months she had been short of breath on the slightest exertion and her feet had been swollen.

P. E. A slightly obese woman with slight dyspnea. Skin universally dry and red, scaling thin scales. No open lesions. In places large purple blotches. Eyebrows and lashes almost all gone. Hair thin, gray. Cervical glands markedly enlarged, other glands slightly. Mucous membranes slightly shiny. Teeth all gone.

Pharyngeal wall showed enlarged superficial veins. Lungs negative except for a few fine râles in the right axilla. Apex impulse of the heart not found. Dullness 17 cm. to the left; not outside right border of sternum to the right. A, slightly accentuated. Artery walls slightly palpable. Abdomen distended, taut. Extremities. Marked pitting edema to the knees. Pupils and reflexes normal.

T. 97.2°-102.5°, with three periods of special and one of slight elevation. P. 73-129. R. 17-36. Urine. 3 20-95, sp. gr. 1.012-1.020; cloudy at one of three examinations, the slightest possible trace of albumin at two, rare to occasional leucocytes at two. Renal function 50%. Blood. Hgb. 50%-80%, leucocytes 129,000-49,200, polynuclears 15%, lymphocytes 81%-60%, one suggestive myeloblast, one megakaryocyte. Platelets much increased. Wassermann negative. Non-protein nitrogen 33 mgm. Blood sugar 0.09 mgm. Basal metabolism April 10 +55%, April 14 +90%, April 24 +59%, May 2 +32%, May 15 +25%. Report of heart consultant March 25. Chest size makes accurate percussion impossible. Normal rhythm with good heart sounds. Blood pressure 154/94. Try effect of digitalis gr. iss t.i.d. for one week. Later advise x-ray for heart size. X-ray April 4. Hilus shadows increased in amount and



Measurements by x-ray.

density. Apices lighted up and diaphragm moved fairly well. Costophrenic angles clear. Posterior mediastinal space showed a few shadows opposite the lung roots. Heart shadow definitely enlarged. Supracardiac dullness increased. Greatest prominence downward and to the left in the region of the ventricle. The heart lay somewhat horizontal in the chest. Heart consultation April 4. I should continue the drug, gr. iss i.d. for another week, and then gr. iss daily for a long time,—as long as the heart condition demands it.

The edema cleared. The parotids swelled and were tender. The abdomen became softer, and a very much enlarged liver and spleen could be made out, the latter slightly tender. A tender tumor in the occipital region appeared. After x-ray over the spleen April 12 the patient had occasional vomiting and malaise for five days. April 17 there was a much swollen gland in the left inguinal region, red, hot, painful and tender, later fluctuant. It was incised and drained.

April 22 the patient was given x-ray over the spleen with no bad results. The wound continued to drain diminishing amounts of pus

daily. May 4 there was a fluctuant swelling above the drain. The skin condition improved under treatment.* The patient felt perfectly well. Slight temperature May 18 and 19 was believed to be due to a small fluctuating abscess in front of the left ear. May 20 she was discharged.

History of interval. After leaving the hospital the patient was given twelve x-ray treatments of the spleen, groins and axillae in the Out-Patient Department. During the summer she gained fifty pounds. June 22 her metabolism was +6%, September 21 —6.5%. Blood: May 4 hgb. 85%, leucocytes 29,600, lymphocytes 60%; May 11, hgb. 80%, leucocytes 18,000, lymphocytes 64%; June 1 hgb. 75%, leucocytes 20,400, lymphocytes 56%; June 8 hgb. 70%, leucocytes 16,800, lymphocytes 43%; November 2 hgb. 85%, leucocytes 8,200, lymphocytes 10%; January 4 hgb. 80%, leucocytes 6,200, lymphocytes 18%. About Christmas time she began to have another attack of erythema over the entire body, persisting, and associated with itching and desquamation. At the onset the redness was very marked. Her general condition remained good.

Second entry, January 8.

P. E. Generalized dull red homogeneous eruption of the skin. Fine thin scaling on arms and body. Face very red, shading off gradually over body. Pharynx reddened. No glands palpable except one bean-sized node in the right posterior cervical chain. *Hear.* Nothing abnormal except a short systolic murmur over the whole precordia. *Abdomen.* Questionable liver edge on deep inspiration. Spleen not felt.

T. 97.8°-100.9°. P. 87-112. R. normal. *Urine.* Normal amount. Sp. gr. 1.022, cloudy at both of two examinations, the slightest possible trace (!) of albumin at one, a few leucocytes at one. *Blood.* Hgb. 70%-80%, leucocytes 6,600-18,000, polynuclears 72%-29%; a general tendency to fall except for one count. February 2 polynuclears 7%, lymphocytes 15%-60% except February 1 80%; eosinophils 4%-11% except once, 1%. Reds normal at seven examinations, showed variation in size at three, in staining at two, in shape at one. Platelets decreased once and possibly at a second examination, a few large forms at three, normal at eight. *Basal metabolism.* January 15 +26%, January 22 +33%, January 29 +31%, February 5 +33.5%. *X-ray* January 27. No evidence of enlargement of the mediastinal glands. Both lung fields clear. Diaphragm rather high on the right but its respiratory movements not limited.

*Balleyle acid gr. x, bismuth subnitrate gr. 30, olive oil 3 ii, lanolin 3 vii.

Orders. January 8. Zinc oxide wash* p.r.n. Veronal gr. x at 8 p.m. January 9. Triple bromides gr. xxx, repeat once if necessary. January 11. Magnesium sulphate 3 ss once a day. Force fluids. Veronal gr. x. January 13. Boric acid and bismuth subnitrate ointment** over entire body 2 i.d. January 17 and 18. Trional gr. x at 8 p.m. with hot milk. January 21. Veronal gr. x. January 22. Veronal x, aspirin gr. x, codeia gr. ss at 8 p.m. January 23. Chloral hydrate gr. x, repeat once if necessary. January 24-25. Repeat order of January 22. January 26. Boric acid ointment to eyelids twice a day p.r.n. Morphia gr. 1/6 s.c. January 27 and 28. Veronal gr. x with chloral hydrate gr. x at 8 p.m. January 29-30. Phenacetin gr. v. Veronal gr. x. January 31. Trional gr. x. Aspirin gr. x. Codeia gr. ss by mouth. February 1. Morphia gr. 1/4 by mouth. February 2 and 3. Aspirin gr. xx with hot milk at 8 p.m. Morphia gr. 1/4 by mouth if very restless. February 4. Morphia gr. 1/4 by mouth. Codeia gr. ss p.r.n. for four doses. February 5 and 6. Veronal gr. x.

The patient felt well except for the skin condition and transient swelling of the left hand and leg. Purpuric lesions appeared on both lower legs, disappearing in two days.

January 18 there was marked increase in the leucocytosis and lymphocytosis with some general adenopathy. The following day x-ray treatment was given over the spleen. This was followed by lowering of the white count and the lymphocytosis. The patient however was more restless, slept poorly, had itching and slight temperature. Two days later she was developing an upper respiratory infection. February 1 with the remarkable lymphocytosis noted there was no obvious change in the general condition. February 3 no x-ray was given because there had been no leucocyte increase during the past week. February 7 the patient was discharged with the skin condition slightly better and the leucocyte count 11,400.

Third entry, February 21. Because of cold weather the patient did not return to the Out-Patient Department. At her re-entry she complained of continued desquamation and increasing weakness. The skin condition was unchanged but she had considerable conjunctivitis. The glands had enlarged.

P. E. Generalized deep redness of the skin with some thickening and branny scaling, especially on the upper chest, hands and feet. Enlarged cervical, axillary, inguinal and epitrochlear glands. Glands in both parotid re-

*Zinc oxid 3 ii, calamin 3 i, glycerin 3 ii, phenol minims xx, water to make 3 viii.

**Boric acid 4, bismuth subnitrate 2, olive oil 8, lanolin 34.

gions and below lobes of the ears enlarged and hard.

T. 97.6°-99.5°. P. 80-120. R. normal. Urine as before. Blood. Hgb. 75%, leucocytes 32,000-84,000 (general rise), polynuclears 15%-6%, lymphocytes 68%-88%, many large lymphocytes at one examination, eosinophils 5%-16%, platelets decreased at one, some variation in size and staining at one. Basal metabolism. March 2 +22%, March 9 +42%, March 16 +22%, March 23 +43.5%.

Orders. February 21. Force fluids. Boric eye wash and boric acid ointment to legs, salicylic acid ointment* to body, iron, arsenic and strychnin** one tablet t.i.d. p.e. Starch bath 1 i.d. Trional gr. x. Later orders are for trional or veronal in ten grain doses at bed time with or without codeia gr. ss; morphia in 1/6 grain doses s.c.; one order for aspirin gr. x, and three for chloral hydrate gr. x.

The patient came for x-ray. The first treatment had no effect on the leucocytosis. The lymphocytosis, however, slightly decreased. By advice of a medical consultant no x-ray treatment was given the week of March 11. March 14 the skin condition was considerably worse and the patient mentally depressed. Two days later the skin condition was clearing up. The white count, however, was still rising. March 19 another series of x-ray treatments was begun. March 23 the skin was decidedly worse and the mental depression severe. March 28 the patient was discharged with a leucocyte count of 84,000.

History of interval. April 7 the patient's neck began to swell and the skin eruption returned.

Fourth admission, April 13.

P.E. Well nourished. Unable to open her mouth because of painful glands near the angle of the ramus of the jaw. Entire skin of the body dark coppery red, wrinkled, inelastic, covered with a large sheet-like to flake-like desquamation. On the face and over the back were some denuded discharging areas, over the right breast numerous vesicles, in the groins considerable maceration of the epithelium. Sclerae injected. Slight seropurulent discharge from the eyes. Two hard walnut sized glands at anterior end of trapezius, many pea to hickory nut sized discrete movable non-painful cervical glands. Bean sized right epitrochlears. Many walnut sized axillary and inguinal glands. Large gland on thigh above scar. **Lungs.** A few crackles at the right base. **Heart.** A loud blowing systolic murmur at the apex and in the

axilla, over the base and the aortic area. **Abdomen.** Liver $2\frac{1}{2}$ cm. below the costal margin. Edge rather rounded, smooth. Spleen 3 cm. below the costal margin, hard, fibrotic, surface somewhat uneven; estimated at two to three times normal size. Above the umbilicus an irregular indefinite shaped mass with slightly increased resistance (mesenteric glands?).

T. 97.9°-103.6°; periods of special elevation April 14-18, June 1-6 and June 14 to death. P. 82-130. R. 20-37. B.P. 140/82. Urine. Amount normal except on two occasions $\bar{3}$ 8. Sp. gr. 1.010-1.026. Cloudy at all of 12 examinations, the slightest possible trace to a very slight trace of albumin at four, leucocytes at three. **Culture** April 23. A few staphylococci. **Renal function** 40%. Blood. Hgb. 80%-50%. Leucocytes 120,000-280,000. Eosinophils 4%-6%. April 13 practically all cells of the lymphocytic series with large nuclei and very little cytoplasm. Reds apparently normal. No achromia. April 16. "All the lymphocytes larger than normal, occasionally as large as a normal large mononuclear." May 21. "The reds now show considerable variation in size, being smaller on the average than normal, and an occasional 'tailed form' is found as well as a polychromatophilic cell. No nucleated cells seen. Platelets diminished in number." June 12. Marked achromia. Considerable variation in size but not in shape. Whites showed the picture described May 21. June 21. Very little variation in size of reds.

The patient was found to be in very much worse condition than at her discharge three weeks earlier. The skin condition was found to be complicated by herpes zoster on the right chest and axilla. May 4 she complained of extreme sensitiveness of the skin with neuralgia-like pains radiating from the spine around the right side of the chest. May 8 the lower pole of the spleen was felt six cm. below the costal margin and 6 cm. to the left of the midline, with a firm, slightly irregular surface. May 20 the skin was a little better.

June 14 subcutaneous nodules were appearing on the sides of the chest, a few on the thighs and arms. Five days later a nodule on one eyelid had broken down and become necrotic. The patient was running a temperature of 103° to 104°. The nodules became more numerous.

As a last resort she was given massive doses of x-ray with little hope of good result. She grew progressively worse; complained a great deal of weakness. The ulcers showed no tendency to heal.

June 28 the dyspnea became markedly increased. Atropin did not lessen the secretions. Morphia was used with much hesitation and only when her increasing restlessness caused extreme dyspnea. No improvement followed.

*Salicylic acid gr. x, bismuth subnitrate $\bar{3}$ i, amyl $\bar{3}$ ii, oil of rose water $\bar{3}$ i.

**Reduced iron gr. i, arsenious acid gr. 1/50, strychnin sulphate gr. 1/120; make 100 tablets.

Later in the evening she became very cyanotic. A natural inspiration followed the pulling of her tongue forward. An emergency tracheotomy was done with temporary relief. During the evening she died.

DISCUSSION

BY DR. RICHARD C. CABOT

NOTES ON THE RECORD

The earlier history gives no indication of a cause for the generalized skin trouble which brings this patient to the hospital for the first entry. To the uninitiated this sounds like an eczema with insomnia and loss of weight due to the itching and irritation.

NOTES ON THE PHYSICAL EXAMINATION

In the physical examination the cardiac dullness seems excessively large, but from the x-ray examination it would appear that the hypertrophy is not so great as this dullness would suggest. The cause of the edema in the legs is not clear. Possibly it may have some connection with the skin trouble, though from the advice of the heart consultant and the somewhat elevated systolic blood pressure it is perhaps reasonable to suppose that the edema is of cardiac origin. There is no evidence of renal disease.

When we come to the blood the diagnosis seems to be given us, since the lymphocytes are so enormously increased in percentage and in total count. At first there is apparently some anemia. The blood sugar and non-protein nitrogen show nothing remarkable, and the x-ray, aside from the cardiac enlargement, brings out nothing of importance. It is very possible that the cardiac enlargement is to be associated with the leukemia which is obviously the diagnosis. The enlargement of the superficial lymph glands is in accordance with this, and the absence of splenic enlargement is not remarkable. The skin lesions are those of leukemia, which in dermatology are often called mycosis fungoides.

The patient leaves the hospital after two months' stay. In the interval between this and her next entry, seven months later, x-ray treatment is carried on and the lymphocytes diminish until finally on the 4th of January they are normal. The skin condition however recrudesces, and it is apparently for that that she enters the hospital the second time.

At this entry there is no glandular enlargement. The blood is at first normal, but later returns to its leukemic constitution. The basal metabolism, ordinarily increased in leukemia, goes up markedly as the leukemia comes back and the glands enlarge. X-ray treatment is begun

again, and the lymphocytes by February 7 are down almost to normal.

Yet a third entry is necessary because of the continuing skin trouble and weakness. This time the glandular enlargement, lymphocytosis and increased metabolism are all present in moderate degree. X-ray treatment seems to help the skin condition but this time has no effect upon the leukemia.

After a few weeks at home she returns on account of the growth of glands under the jaw, preventing her from opening her mouth. The skin condition is now considerably worse, and there is a conjunctivitis, as once before. The spleen is now palpable and the liver enlarged. The degree of leukemia is greater than at any previous time. Presumably the marrow is now involved, as there is now a considerable degree of anemia. The last months of life are made more distressing by the presence of a herpes zoster with its sharp chest pains. The spleen is larger than before, and innumerable subcutaneous nodules keep appearing and ulcerating. The cause of death is not very clear, but it is probably related to the growth of glands pressing on the respiratory tract.

DIFFERENTIAL DIAGNOSIS

About the diagnosis there is no possible doubt. It is malignant lymphoma with blood metastasis, for which the ordinary name is lymphoid leukemia. Many of these lymphomata are under the skin and thus were probably called in life mycosis fungoides. The liver, spleen, kidneys and marrow are probably infiltrated, as well as innumerable collections of lymphoid cells both in the normal situations and elsewhere. Very possibly there was a terminal infection, streptococcus being the commonest type. The cardiac hypertrophy has already been spoken of and is probably connected with the leukemia and the increased viscosity of the blood.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Dermatitis exfoliativa (7 years).
Lymphatic leukemia (17 months).

DR. RICHARD C. CABOT'S DIAGNOSIS

Lymphoid leukemia.
Septicæmia, streptococcus?
Hypertrophy and dilatation of the heart.

ANATOMICAL DIAGNOSIS

1. Primary fatal lesions

Dermatitis exfoliativa.
Lymphatic leukemia.
Lymphoma of skin, spleen, liver, lungs, bone marrow, retroperitoneal and axillary lymph glands.

2. *Secondary or terminal lesions*

Septicemia, streptococcus.

Slight hypertrophy and dilatation of the heart.

3. *Historical landmarks*

Decubitus.

Cholelithiasis.

Myoma of the uterus.

DR. RICHARDSON: Most of the hair of the head was wanting. The scalp, ears, forehead and face showed innumerable minute to smaller and larger brownish red areas which were the bases of superficial losses of substance. Some of these were dry, while others were reddened and moist to weeping. In the region of the left eyebrow there was a loss of substance 2 cm. by $1\frac{1}{2}$ cm. the margins of which were thickened, indurated, and the central portion of the base was soft dirty yellowish and rested in the subcutaneous tissues.

The brain tissue was a little wet, but otherwise negative.

The skin of the trunk and extremities showed brownish scaling in places and some wrinkling. The palms of the hands and soles of the feet were scaly and in many places the skin showed areas similar to those on the scalp. In the sacral region there was a bed sore. Here and there the intact skin rested over small firm nodular masses in the subcutaneous tissue. The retroperitoneal glands were enlarged up to 6 cm. in greatest dimension, and were in smaller and larger clusters extending from the region of the lesser omentum down along the aorta and out along the iliac vessels. The axillary glands were also enlarged up to 4 cm. and were in clusters. The tissue of these enlarged glands was pale grayish, homogeneous, and altogether a plump lymphomatous rather elastic tissue.

Here and there in each lung there were small firm discrete spheroids which on section were seen to be made up of a pale grayish, firm, somewhat elastic granular tissue. The largest of these was 12 mm. across. Some of these spheroids rested just below the pleura and others deeper in.

The heart weighed 391 grams,—slightly enlarged, but otherwise negative.

The liver weighed 3000 grams,—considerably enlarged. The surface showed here and there minute pale grayish nodules. The tissue showed slight increase of consistence and the section surfaces presented here and there minute to small areas and streaks of pale grayish homogeneous tissue. In some places these were gathered into minute to small grayish knots up to 5 mm. across.

The gall-bladder contained about 200 stones varying from 2 mm. up to 2 cm. in greatest

dimension. The mucosa of the gall-bladder showed no definite lesions. The bile ducts were free and negative.

The spleen weighed 750 grams,—much enlarged. There were a few adhesions between the organ and the under surface of the left lobe of the liver. The surface elsewhere was fairly smooth. There were three small accessory spleens. The splenic tissue was purplish red, plump, and a little soft, with here and there some indefinite pale streaks and areas.

The bone marrow of the right femur was pale grayish-brown, homogeneous, filled the cavity, was rather meaty, and cut out easily.

CASE 10022

A widowed Irish cook of fifty-two entered February 9.

F. H. Her father died of "shock."

P. H. She had measles, diphtheria and whooping cough in childhood, gall-stones at thirty-nine, rheumatism at forty-seven and a nasal operation at fifty. She passed the menopause at forty-seven.

P. I. Five months ago she stopped work because she was "tired out." For the past five weeks she had had nosebleeds accompanied by headaches, the last the evening before admission. For four weeks she had had palpitation and increasing dyspnea. February 5 she had pains in the right hand and shoulder, and jaundice which had persisted. February 7 she had shooting pain on the inside of the thighs with swelling of the legs. This pain spread slowly down, and the swelling had increased so that at admission her legs felt "burning and bursting." The pain did not reach the groins. At admission all her fingers were painful. She had some orthopnea. Her appetite and sleep were poor. Her bowels were irregular.

P. E. Well nourished. Skin and conjunctivae yellow. Upper teeth false, lower gone. Tonsils slightly reddened. Apex impulse of the heart not found. Left border of dullness in the sixth space. See diagram. 5 | 13 2

Sounds and action normal. Systolic murmur at the apex transmitted to the axilla and heard all over the precordia. A short diastolic in the third left interspace. A₂ accentuated. Pulses normal. Lungs normal. Abdomen flabby. Slight distasis of the recti. Umbilical hernia. Sharp edge of spleen felt. Extremities. Marked edema of entire lower legs and feet. Pupils and reflexes normal.

T. 99.8°-102°. P. 88-119. R. 19-30. Urine.

Normal amount. Sp. gr. 1.020-1.022, cloudy at one of six examinations, neutral at one, the slightest possible trace to a slight trace of albumin at all, sugar at two (1.6 per cent. at one), leucocytes at one, rare red blood corpuscles at one. Blood. Hgb. 80 per cent. Leucocytes 12,000. Smear not remarkable.

The patient was found to be evidently an alcoholic. She complained bitterly of thirst and was at times delirious. By February 13 the edema was almost gone. Sugar appeared in the urine that morning. After this the condition did not change markedly except for decrease in the amount of sugar excreted until February 16. That evening she suddenly vomited a large amount of blood and passed bright blood by rectum. The pulse became small and rapid. She was quieted with morphia. The pulse rose steadily and became weaker until the next morning, when she died.

DISCUSSION

BY DR. RICHARD C. CABOT

NOTES ON THE RECORD

Nosebleed and headache at fifty-two always suggest nephritis, especially when associated as here with palpitation and dyspnea. The pains in the right hand and shoulder and the jaundice are not thus to be accounted for, but the edema of the legs is quite in accord with this idea.

NOTES ON THE PHYSICAL EXAMINATION

Physical examination shows besides the marked jaundice a considerable enlargement of the heart with a diastolic murmur which if it persists and is associated with vascular phenomena to correspond may point to aortic regurgitation. As a matter of fact however no other mention of this murmur is made, and the pulses are normal, so that we have no reason to believe that it is of importance.

Evidently the spleen is slightly enlarged, and for this no obvious cause is apparent.

The urine is not at all characteristic of nephritis, though perfectly consistent with an early stage of such trouble. The mild diabetes which has not affected her nutrition is probably of no considerable importance in the case.

We come now to the three terminal symptoms, thirst, delirium and gastro-intestinal hemorrhage, the latter obviously the cause of death.

DIFFERENTIAL DIAGNOSIS

Let us discuss first this hemorrhage. The right shoulder pain might be due to aneurismal pressure and the terminal hemorrhage to rupture of the sac. Physical examination however does not bear this out, although the diastolic

murmur at entrance might be interpreted by involvement of the aortic valves in the same syphilitic process which has produced the aneurism. But with so few symptoms and so few signs one could do hardly more than mention this trouble.

A peptic ulcer often complicates arteriosclerosis with nephritis and cardiac hypertrophy. It is quite possible that this patient bled to death from such an ulcer. There is no evidence of cardiac infarct or of pulmonary tuberculosis as cause for the hemorrhage.

Cirrhosis of the liver is of course suggested when we are told that she is an alcoholic. But there is no evidence of portal stasis or of any change in the size of the liver. The sharp-edged spleen however would go well with cirrhosis.

On the whole I know no better diagnosis than this to make. The other symptoms reminding us of uremia can be accounted for by the toxemia of cirrhosis. On the whole, then, this seems to be the best diagnosis, with peptic ulcer complicating arteriosclerosis as a second possibility.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Cardiorenal disease.
Cirrhosis of the liver.

DR. RICHARD C. CABOT'S DIAGNOSIS

Chronic interstitial hepatitis.
Gastro-intestinal hemorrhage.
Hypertrophy and dilatation of the heart.

ANATOMICAL DIAGNOSIS

1. Primary fatal lesions

Chronic interstitial hepatitis.

2. Secondary or terminal lesions

Extensive hemorrhage into stomach and intestines.

Anemia.

Acute glomerulonephritis.

Icterus.

Hypertrophy and dilatation of the heart.

Soft hyperplastic spleen.

Arteriosclerosis.

Chronic passive congestion, general.

3. Historical landmarks

Cholelithiasis.

Omental umbilical hernia.

DR. RICHARDSON: The head was not examined.

The skin generally showed a pale yellowish tinge.

In the anterior abdominal wall there was a very small omental umbilical hernia. There was no evidence of engorgement of the cutaneous veins in the anterior wall of the abdomen or of the thorax.

The trachea and bronchi contained much pale froth, and the mucosa was pale.

The lungs showed chronic passive congestion.

The heart weighed 602 grams,—considerable hypertrophy. The myocardium was of good consistence, pale brownish-red, thick, and the right ventricular wall measured 5 mm. and the left 17 mm. The columnae carneae were well marked. The cavities of the heart were moderately enlarged and the valve circumferences were mitral 11 cm., aortic $6\frac{1}{2}$ cm., tricuspid $12\frac{1}{2}$ cm. The valves were negative and the coronary arteries were free. The aorta showed in the descending thoracic and abdominal portions considerable fibrous and fibrocalcereous change; elsewhere it was fairly smooth. There was a slight amount of arteriosclerosis of the great branches of the aorta.

The liver weighed 2410 grams,—moderately enlarged. Between the organ and the diaphragm there were a few old adhesions. The capsule was glassy and rounded up over a finely to coarsely nodular liver tissue. The tissue generally was tough, leathery, and the natural markings lost.

There was some dilatation of the bile ducts, and the gall-bladder contained two smooth surfaced blackish-green irregularly shaped stones each about 2 cm. in diameter. The bladder otherwise was negative. The bile ducts were free, but were dilated. The hepatic duct circumference was about 2 cm., and the common duct circumference about 3 cm. The common duct narrowed rather abruptly to about its natural caliber just before it opened into the ampulla. The mucosa of the bile ducts was negative.

The spleen weighed 433 grams,—considerably enlarged,—and the tissue was plump to slightly mushy.

The kidneys combined weighed 449 grams,—slightly enlarged. The capsules stripped and the tissue markings were made out with a rather wide cortex, 7-8 mm. There were a few areas of ecchymosis in the mucosa of the pelvis.

The stomach was slightly enlarged and contained a great amount of frank brownish-red blood clot in smaller and larger masses, and a considerable amount of brownish-red bloody fluid. The mucosa of the organ other than for a few areas of ecchymosis was not remarkable.

The intestines contained a considerable amount of brownish-red bloody fluid and small masses of brownish-red blood clot distributed along them. There were a few scattered areas of ecchymosis in the mucosa, but it was free from ulceration.

CASE 10023

A married colored washwoman of twenty-seven entered March 7.

F. H. Good as far as recorded.

P. H. Negative except for sharp pain the first day of catamenia. Her bowels were constipated.

P. I. As long as she could remember she had had leucorrhea. For the past three months she had had continuous flowing of blood, not blood-tinged discharge, with pain in the small of her back.

P. E. Well nourished. *Heart.* A_2 accentuated. No other abnormalities. *Lungs* normal. *Abdomen.* General stiffness from well developed muscles. Slight tenderness and spasm low down on the right. No masses or rigidity. Liver from the sixth rib. Edge felt on deep inspiration two inches below the costal margin in the midclavicular line. *Pelvic examination.* Intact cervix. Uterus retroverted two degrees and retrocessed. A tender mass on the left the size of a hen's egg. Similar mass on the right. Flowing. *Extremities, pupils and reflexes* normal.

Before operation *chart* normal, *urine* and *blood* not recorded.

March 8 operation was done. The patient made a good ether recovery, and did well at first. March 10 she was rather uncomfortable from gas and had slight distention, somewhat relieved by an enema. The wick was shortened about an inch and a half daily.

The night of March 21 she had a chill, but promptly went to sleep and passed a comfortable night. The next morning her temperature was up and she felt ill. The only definite symptoms were headache and loss of appetite. The temperature continued to rise to 104° , and during the next four days swung from 102° to 104.3° . The pulse ranged from 90 to 110. Physical examination was negative except for a firm tender mass in the posterior cul-de-sac felt March 22 but not March 23. March 24 there was some slight difficulty in breathing, with pain beneath the sternum. There were still no signs in the lungs.

March 25 there was pain, tenderness and swelling in the right calf. That evening the respirations were about 60, the pulse rapid and almost imperceptible. This condition developed within an hour. Next morning the heart was somewhat dilated, the conjunctivae bright orange, and the right calf swollen to nearly twice its normal size and very tender. A blood culture taken March 24 was reported as containing a diplococcus resembling the gonococcus.

March 26 the patient died.

DISCUSSION

BY DR. EDWARD L. YOUNG, JR.

Anything that will cause marked pelvic congestion will of course cause flowing and cause backache.

With the description of the mass here, which is on both sides and is tender, double salpingitis or tubo-ovarian abscess seems to be the most likely diagnosis, and on that basis the only treatment which is going to do her any good is of course the removal of the mass.

I do not see that we have any right seriously to discuss fibroid, ovarian cyst, uterine pregnancy. Those conditions do not come in a bilateral fashion with a tender mass such as is described here. So that I think we have to assume sepsis and nothing else. The operation was for that.

DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Double salpingitis.

PRE-OPERATIVE DIAGNOSIS

Not recorded.

OPERATION

Ether. Lithotomy position. The cervix was dilated and the uterus curetted. A moderate amount of tissue was obtained. A sponge was left in the vagina.

Trendelenburg position. Five inch low median incision. Right tube and ovary found glued up in a mass of inflammatory tissue and adherent to everything. They were finally freed up and removed. The left tube and ovary were found similarly adherent and inflamed and were also removed, leaving however about a third of the ovary. The ends of the tubes were dissected into the cornua of the uterus and the wall of the latter sutured over the roots of the tubes after these had been carbolized. Cigarette wick to the fossa of Douglas.

PATHOLOGICAL REPORT

Small fragments curetted from the uterus, showing upon microscopic examination the structure of the normal mucosa.

Also both ovaries with the tubes attached, red-dened, thickened, with retention cysts.

Chronic salpingitis.

W. F. WHITNEY.

FURTHER DISCUSSION

In the normal course of events she should have made a complete recovery, because this

type of sepsis is as a rule of low virulence; in fact it is often entirely sterile.

Either this mass was not felt March 22 or it made an extraordinary disappearance.

This is a rather unusual story of acute sepsis starting nearly two weeks after the operation, undoubtedly a generalized sepsis, starting probably from the pelvis with what look from the description like infarcts in the kidney and perhaps infarcts above the diaphragm, but a generalized sepsis with what we are told is a possible gonococcus in the blood stream. I think we shall have to leave it to Dr. Richardson to tell us the various places in which that localized. As I remember it it is an extremely unusual thing to get a gonococcus septicemia with these symptoms, isn't it?

DR. RICHARDSON: Does it state gonococcus?

DR. YOUNG: "A diplococcus resembling the gonococcus." That is all it says. It would be much more likely to be a streptococcus, and from the work done at different places it is sometimes very difficult to differentiate between the gonococcus and the streptococcus in staining and morphology.

DR. RICHARDSON: That information that you have there would have been received with open arms.

DR. YOUNG: Yes. I think it was Rosenau who a few years ago thought he had proved the transformation of bacteria, and this laboratory that was partly responsible in disproving the theory.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Double salpingo-oöphoritis.

DR. EDWARD L. YOUNG'S DIAGNOSIS

Double salpingitis.

Septicemia streptococcus.

ANATOMICAL DIAGNOSIS

1. Primary fatal lesions

Salpingitis with pelvic abscess.
Streptococcus septicemia.

2. Secondary or terminal lesions

Acute degeneration of the myocardium, liver and kidneys.
Hemorrhages in lungs.
Hemorrhage in wall of uterus.

3. Historical landmarks

Salpingo-oöphorectomy.
Adenoma of left adrenal.

DR. RICHARDSON: The interesting point in the case is that there was a large abscess cavity

in the region of the pelvis and the small intestines were adherent to the wall of this abscess. The peritoneum otherwise was in pretty good condition. Associated with this were hemorrhages in the lungs and a streptococcus septicaemia. It is well to note that in streptococcus infections there are among the satellite conditions hemorrhages with necrosis in various situations, usually in the lungs, and once in a while we find them along the mucosa of the gastrointestinal tract. Here they may go on to necrosis and even perforation.

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ANTIKETOGENESIS: ITS MECHANISM AND SIGNIFICANCE

SHAFFER, P. A. (*Medicine*, November, 1923), summarizes, in a well-arranged paper, the present conception of ketogenesis and its prevention, with special reference to its dietetic aspects in diabetes mellitus. The subject-matter is not new, and has been widely discussed by various investigators within the last few years. The chief value of the review is that the subject is considered in a relatively simple manner, without involving the reader in a mass of theories and chemical formulae. The author indicates clearly that in all but the severest diabetics antiketogenesis may be obtained by observing a diet which contains a ration of approximately one mol of antiketogenic substance to one mol of ketogen. A ratio of 1:1 represents the optimum diet, although a lower content of available carbohydrate is sufficient in many cases. In severe diabetics, where ketosuria and glycosuria are both present, together with a low sugar tolerance, additional considerations arise. In these cases "either the carbohydrate tolerance must be raised by insulin, or the total metabolism lowered by rest, low protein diets, under-nutrition or fasting, until the rate of keto acid production no longer exceeds the tolerance." The use of charts, such as those devised by Wilder or Hannon and McCann, for the calculation of diets, is advocated, although with the reservation that further revision may be necessary.

Of interest is Shaffer's discussion of the ketolytic derivative of glucose that is the important factor in antiketogenesis. By careful *in vitro* experiments he produces strong evidence that such a substance is an oxidation product of glucose, or other hexoses, which condenses with two molecules of aceto-acetic acid, with further oxidation. The ketolytic derivative of glucose is probably an oxidation product higher than methyl glyoxal.

Apart from any hypothetical considerations, the

article provides an extremely readable discussion of the ketogenic balance in man, with valuable suggestions as to the treatment of ketosis in diabetes.

[C. M. J.]

THE ETIOLOGY AND PATHOGENESIS OF RICKETS

HOWLAND, J. (*Medicine*, November, 1923), presents a very instructive and readable review of our present knowledge of the etiology and pathogenesis of rickets. In discussing the history of the disease the author emphasizes the fact that rickets is only of recent origin. Little, if any, existed prior to the 17th century, and it was first noticed with the advent of overcrowding and improper diet incident to modern city life.

After reviewing the early investigative work, Howland gives the results of recent animal work in producing and studying experimental rickets. Diets low in phosphorus and high in calcium, or *vice versa*, are capable of producing rachitic changes in animals. Such rachitic changes can be absolutely prevented or cured by the use of diets containing at least 2 per cent. of cod liver oil. Butter fat and other fats are efficacious, but much larger amounts are necessary to produce good results. The antirachitic factor has long been considered to be fat-soluble A, but recent work indicates that the cause of rickets lies in the absence of some other substance than this vitamin. Experimental and clinical rickets can be successfully treated not only by cod liver oil, but also by sunlight or the use of the mercury vapor quartz lamp.

Careful investigations have shown that the disease consists essentially in an inability to deposit Ca in normal amounts in the bones. This is explainable on the basis of a reduction of the calcium and inorganic phosphorus content of the blood serum. Of the two it has been found that the reduction of the inorganic phosphorus is the more important factor, this element always being extremely low in the blood of rachitic patients. An interesting discussion of the mechanism of Ca precipitation indicates that calcification depends on (1) a proper Ca concentration in the blood, and (2) a proper concentration of the serum phosphorus. In rickets there is improper calcification, even on a high Ca intake, unless there is a normal P content of the serum. The low P content in rachitic blood is due in many cases to faulty absorption, this being especially true on low fat diets. The feeding of cod liver oil, or therapy by mercury vapor quartz lamp or sunlight, all increase the absorption of Ca and P, decrease the excretion of these substances in the stools, and thereby permit normal calcification.

Rickets is presented, therefore, as a deficiency and environmental disease, the mechanism and cure of which is well understood. The article is an inspiring one from the point of view of clinical and laboratory investigation, as well as that of preventive medicine. Unfortunately the author has been unable to include the recent work of Park and his collaborators on the isolation of the antirachitic substance.

[C. M. J.]

SUBPERIOSTEAL RESECTION OF LONG BONES IN OSTEOMYELITIS

BEYER, H. L. (*Surg., Gyn. and Obstet.*, December, 1923), reviews the treatment of five cases under a more conservative method of treatment than complete excision of the diseased long bone and concludes by stating that he believes that it is fundamentally unsound to do a subperiosteal resection of the shaft of the long bone for osteomyelitis, for in performing such an operation bone may be sacrificed, which if properly drained, would not only be viable but might play an important part in the restitution of the diseased shaft. Regeneration of bone from the perioste-

um remaining after subperiosteal resection may be limited and stop far short of a functional end-result. Deformities are likely to follow such an operation, with resultant functional disability, and the radical removal of diseased bone by this method does not necessarily mean that the infection has been entirely eliminated.

[E. H. R.]

EDEMA

LOEB, L. (*Medicine*, August, 1923), in a review of 170 pages, discusses in great detail the available clinical and experimental data on the subject of edema. Over 450 original articles are included in the bibliography. From the mass of accumulated data on the subject it is evident that at present our knowledge of the fundamental causes of edema is still largely hypothetical. The influence of changes in capillary permeability, defective circulation, decreased extravascular pressure, obstruction to the lymphatic circulation, the rôles of Na, K, and Ca, changes in osmotic and diffusion potentials, the part played by blood and tissue proteins, all receive full consideration. Pulmonary edema, edema of the brain, that due to faulty diet, edema of renal origin, etc., are all discussed separately. Colloids and their influence on water distribution, the significance of hormones, the relation between edema and acidosis, and the chemistry of edematous fluids are further phases of the subject that are considered.

Obviously a satisfactory résumé of the monograph is not possible in such an abstract. It is clear, however, that our knowledge of the fundamental processes involving the production of edema is very defective. There are many apparent or real contradictions in both clinical and experimental observations. Certain points stand out, however, as of primary importance.

Loeb defines edema as an interference with the mechanism which tends to keep constant the constitution of the blood, and secondarily the fluid of the tissue spaces. A multiplicity of factors operate in the production of edema. Primary factors which regulate the normal movement of water and dissolve substances represent a more or less connected mechanism which includes the absorption, circulation and elimination of fluid. Secondary factors include diffusion and osmotic potentials, perhaps endoelectromotive forces, changes in the permeability of membranes, and probably to a limited extent filtration pressure. There is, in addition, a third class of factors, through which the above exert their effect. These include the distribution of NaCl and of proteins, changes of equilibrium of ions (Na, K, Ca), the action of certain hormones, and other conditions. The above factors are all of importance in the normal regulation of fluid balance in the body. Experimental and clinical observations indicate that any deviation from normal in these regulatory mechanisms form the basis for the production of edema.

Changes in the permeability of the capillaries may be produced by local inflammation, possibly by substances given off by diseased kidneys, by an altered circulation, or by changes in the balance ions in the tissues. Potassium increases capillary permeability, calcium decreases it. In addition carbon dioxide tension, hydrogen ion concentration, oxygen tension, and certain hormones like pituitrin and adrenalin affect capillary permeability. Apparently no direct relation exists between hydrops and edema, or acidosis and edema. Changes in filtration pressure, with their close relation to alterations in blood pressure, are probably of minor importance in the production of edema. The distribution of NaCl plays a very important rôle in the causation of edema, while the distribution and movements of proteins play a similar, but much less important part. The distribution of the

sodium ion, more than that of any other substance, has the most positive effect on the development of edema.

A careful study of the article indicates that present evidence, although admitting the importance of numerous contributory factors, points to changes in the permeability of capillaries, together with variations in the concentration of NaCl, as being mainly responsible for the abnormal retention of fluid in the interstices of the tissues and in the serous cavities.

From a physiological point of view the article is of interest, inasmuch as it summarizes our present knowledge on the subject of edema, and indicates the necessary points of approach for future investigation. For the average reader, however, the article seems confused, rather poorly arranged, and with such a mass of contradictory findings that his understanding of the subject is little clarified after a painstaking study of the matter presented.

[C. M. J.]

DUODENAL HERNIA—A MISNOMER

ANDREWS, E. (*Surg., Gyn., and Obstet.*, Dec., 1923), reports a very interesting case in which all of the small intestines were found completely embedded in a firm membrane which held them as in a complete sac, the terminal few inches of the ileum and the large colon being the only parts of the intestines visible on opening the abdominal cavity. He presents diagrams of the fetal development showing that this condition is entirely a congenital anomaly due to the imprisonment of the small intestine beneath the mesentery of the developing colon. An excellent bibliography, with report of all cases since 1906, is appended.

[E. H. R.]

PEDUNCULATED POLYPOID FIBRO-ADENOMA OF THE STOMACH OF BALL-VALVE TYPE, CAUSING AN UNUSUAL AND COMPLEX SYNDROME

MATAS, R. (*Surg., Gyn., and Obstet.*, December, 1923), reports a very interesting and unusual case which very closely simulated the last stages of a malignant condition of the stomach. The patient had acute attacks of intense epigastric pain with marked shock, rapid loss of weight, profound secondary anaemia. Exploration of the stomach showed poly-poid growth which ball-valved into the pylorus, causing acute obstruction of the pyloric end of the stomach, followed by a reduction of the tumor spontaneously and immediate relief of symptoms.

Matas points out that it is the failure to recognize that a benign and especially a pedunculated tumor of the stomach may assume a very malignant aspect ending in death, that is largely responsible for the little attention that is given to these tumors in scanning the differential diagnosis. The one salient fact that comes out of the discussion of a case of this kind and that is to be retained by the surgeon in approaching a surgical gastropathy is that the most perfect picture of cancer of the stomach may be imitated even to a fatal issue by a perfectly operable benign growth.

[E. H. R.]

TRANSPERITONEAL CERVICAL CAESAREAN SECTION

PHANEUF, L. E. (*Surg., Gyn., and Obstet.*, December, 1923), presents an interesting article on the evolution of the transperitoneal section. He describes the Hirst, the Kroenig, and the Beck operations and gives the indications for each. In difficult septic cases he prefers the Hirst operation, and he states in conclusion that the transperitoneal cervical Caesarean section offers a definite protection against septic peritonitis; there is practically no shock as the intestines are not handled; there is less bleeding; the

mother has a much easier convalescence; there is better healing since excision is in the cervix and non-contractile part of the uterus; there is less danger of rupture in subsequent pregnancies and labor; and an efficient test of labor may be given with safety.

[E. H. R.]

CHANGES OF PRESSURE INSIDE THE FETAL CRANIO-VERTEBRAL CAVITY

CROTHERS, B. (*Surg., Gyn. and Obstet.*, December, 1923), writes a very thorough, well-worked-out, partially experimental article, on this interesting subject and presents the following conclusions:

"In this paper the results of the imposition of force upon the fetus during delivery are considered from a neurological and physiological point of view.

"The most important lesions, directly referable to force, are: (1) rupture of the falx or the tentorium, and (2) rupture of the cervical spinal column. These lesions are not in themselves fatal, but they expose the medulla and the upper cord to injury.

"Under ordinary conditions the medulla is guarded from harmful pressure by the tentorium, which modifies and controls force imposed upon the vertex, and by equilibrium of fluid pressure at the foramen magnum, which prevents downward dislocation of the contents of the posterior fossa. This balance of pressure can be upset and herniation of the cerebellum and medulla produced by rupture of the dural septa or by combinations of forces which maintain or increase intracranial pressure while diminishing spinal pressure.

"Breech extraction, as usually performed, brings dangerous and unphysiological forces into play. Pathological evidence shows that rupture of the tentorium occurs in 88 per cent. of the still-births following so-called normal breech labors. In addition a considerable number of injuries of the vertebral column or of the spinal cord can be logically attributed to traction during breech deliveries.

"Aside from the gross injuries, which account for about half of the death rate in viable newborn babies, various alterations in pressure during delivery and certain maneuvers during resuscitation may produce fatal or disabling lesions within the central nervous system.

"Asphyxia, as commonly described in obstetrical literature, is vaguely defined. Pathological and experimental evidence of its existence is not available. While the absence of proof is not in itself evidence against the obstetrical conception, it invites challenge. The pathological findings, particularly those in babies dying after breech delivery, raise the question whether efforts to avoid fetal asphyxia may not add to the already great risk of injury to the contents of the craniovertebral cavity."

This article is followed by a rather similar article by R. N. Pierson as a result of clinical pathological study of 38 cases, these two articles forming a symposium on this subject. The conclusions drawn by the latter author are as follows:

"Birth injury and shock in breech deliveries cause greater fetal mortality and morbidity than asphyxia. "Unnecessary haste in breech extractions, prompted by fear of fetal asphyxia, often causes obstetrical complications leading to birth injuries.

"The diagnosis of death from asphyxia in breech deliveries is only justified when (a) there is strong clinical evidence of asphyxia, but none of injury; and (b) when complete autopsy shows characteristic signs of asphyxia, but none of injury.

"The incidence of breech extraction may be diminished by (a) the practice of external version when possible; (b) and by stricter limitation of the indications for version and breech extraction.

"The high mortality and morbidity of breech deliveries may also be reduced by:

a. A management of labor and delivery that will effect full dilatation of the soft parts.

b. Accommodating, in delivery, the long axis of the child to the axes of the pelvis, thus avoiding dangerous angulations. And by accommodating the longest diameters of the body, shoulders, and head, to the longest diameters of the pelvis, thus avoiding a dangerous degree of traction and suprapubic pressure."

[E. H. R.]

CADET PROBLEMS

KERNS, HARRY N. (*Mental Hygiene*, Oct., 1923). Dr. Kerns takes up in a most interesting paper the particular problems he has to deal with at West Point. He has noted carefully the mental reactions of the students to their necessarily rigid life and strongly advocated the teaching of mental hygiene as a part of the regular course in general hygiene, supplemented with lectures by visiting psychiatrists. He thinks West Point a fertile field for incipient nervous disorders, partly because of the routine grind of activities. He notes in detail three cases of conversion hysteria. In spite of the monastic environment, he has never met a conscious homosexual problem among the cadets. There were two suicides at West Point in 1920.

[H. R. V.]

THE MENTAL HEALTH OF 581 OFFSPRING OF NON-PSYCHOTIC PARENTS

CANAVAN, MYRTLE M., and ROSAMOND CLARK, (*Mental Hygiene*, Oct., 1923). Over 500 children of non-psychotic parents were studied at the Peter Bent Brigham Hospital. One hundred and forty-five deviated from the normal either mentally, physically or socially. The results of this study are compared with previous studies of children of epileptic parents and of parents with dementia praecox. Conduct disorders were much higher in children of dementia praecox parents but physical defects much higher in those of non-psychotic parents. Only one case of undoubted mental disease was found.

[H. R. V.]

THE EFFECTS OF INJECTING COLLARGOL INTO THE VAS DEFERENS

BRAMS, JULIUS (*Jour. of Urology*, Nov., 1923), states that the injection of 5 per cent. collargol into the vas deferens causes an intense acute inflammatory reaction which results in destruction of the epithelial cells lining the lumen, edema of the mucosa and muscularis, and a dense round-cell infiltration into these layers. At the site of the injection the effect of the trauma, in addition to that of the collargol, results in an exudation of fibrin on the serosa which organizes and becomes adherent to the surrounding structures. This may result in permanent kinks or twists of the vas which can cause partial occlusion of the lumen. At the point of injection there is proliferation of fibroblasts at the site of the lumen which results in complete obliteration due to stricture formation within two weeks after injection.

[B. D. W.]

REJUVENATION EXPERIMENTS WITH VAS LIGATION IN RATS

MACHT, D. L., and TEAGARDEN, E. J., JR. (*Jour. of Urology*, Nov., 1923), report that the effect of ligation of the vas deferens in senile rats was studied on their behavior in the circular maze, their muscular coordination, weight and general appearance. No change was produced in the behavior of rats in the circular maze. A definite improvement in the muscular coordination, muscular efficiency and general appearance of the rats was noted but it was of a transient nature. The results of the experiments warrant further investigation of the subject.

[B. D. W.]

THE BOSTON Medical and Surgical Journal

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A RENEWED EFFORT BY THE CHIRO- PRACTORS

A GROUP of persons desirous of securing state endorsement of chiropractic are organizing a campaign for the purpose of securing the enactment of a bill which will authorize the licensing of chiropractors in Massachusetts. A prominent lawyer, familiar with legislation through experience in the House and Senate, has been retained. A bill is under consideration providing for a board of chiropractic examiners which will, if enacted, give authority to register practitioners of this cult. If approved by the Legislature the Massachusetts law regulating the practice of medicine will be very much weakened. The policy of this State has been to have a single standard for all practitioners of the healing art. Inadequate as this law has been, it is far better than to have the complications found in those States where the various cults are recognized. Under our law conditions have steadily improved. Comparatively few graduates of low-grade schools succeed in securing registration. Over 75 per cent. of the graduates of one of these schools fail on the first examination, and the record of the other two is but very little better.

The demonstration of irregular registration

in those States in which different boards and standards are allowed is impressive.

The question is again fairly before the people. The medical profession has a definite responsibility, not because the scientific practice of medicine is imperilled, but because physicians are in duty bound to protect the ignorant. When the word "ignorant" is used some persons construe the application as intended to mean the "illiterate." So far as this controversy is concerned it applies sometimes to persons of means and a degree of education. Sometimes even college graduates are not educated beyond the acquisition of facts, and it is not uncommon to find among people successful in accumulating wealth, ignorance of the fundamentals of true values, and, conversely, many who are less favored in material good fortune have a native intelligence and power of discrimination which render them impervious to the wiles of the pretender.

Every person who does not know that scientific study has given to the world almost everything of advantage in preventing and curing disease is ignorant. Unfortunately some very ignorant persons have influence beyond the common asset of the individual vote, for voluble speech coupled with enthusiasm carry weight with the unthinking. When positive assertion of the value of the theory of a cult is supplemented by appeals to prejudice and testimony of alleged failures by the regular practitioner of medicine and success by the cultist, history shows that great numbers of persons are impressed to the extent of endorsing the most fantastic claims. The weakness of medical men in arguments employed to influence the people has seemed to lie in the dignity and conservatism of well-equipped physicians. The advocates of chiropractic have not been accused of modesty. If they follow the custom employed elsewhere they will have people testify to having been cured of epilepsy, paralysis, cancer, and every other disease without external evidence of its presence.

The average layman cannot be blamed for believing the statement of the Rev. Mr. Blank that he has been cured of pernicious anemia by a "chiro" after having been given up to die by the staff of a five-hundred-bed hospital. Then the "chiro" will tell his legislative audience that he is denied the privilege of saving all the other dying persons in the big hospital but the poor sufferer outside should be given this heaven-sent blessing. After these statements the legislators of more than half our States, overcome by the hysteria of the occasion, decide to give the cultist his chance to save the medical outcast. As one very intelligent gentleman observed to the writer, "Well, chiropractic won't do the patient any harm." The harm consists in two important features: First, the people are deceived and induced to pay for a fraud, and second, the

work of any untrained doctor tends to break down the public health service of the State.

Can a chiropractor diagnose tuberculosis or cancer in its early stages? Will he recognize the communicable diseases? Will he ally himself with the public health agencies of the State? The answer is, "Seldom, if ever." What can he do? He can apply a certain type of mechanical manipulation which has no curative power whatsoever when applied to actual disease. For this he is paid. He can convince some people that a serious disease exists where none is present, and in a proportion of the cases will be believed, and when the functional trouble disappears he will be given credit for a cure.

The great outstanding objection lies, however, in the treatment of those who have incipient disease in a curable stage. A parent may be treated by a chiropractor for a backache and the discomfort may have disappeared; through the faith developed by this result, the chiropractor may be called to the child with diphtheria, and awakened distrust may come too late.

We have a definite responsibility to perform. Our regard for the people and our pride in this Commonwealth should stimulate action.

WILL THE PROFESSION COÖPERATE?

THE Massachusetts Medical Society has inaugurated a section of obstetrics and gynecology. One of the features of the annual meeting in Pittsfield was the program of this section. The papers and the discussions dealt with some very important questions confronting the obstetrician. The section has published an announcement of its purpose to be a functioning department of the Society throughout the year. It is obvious that there is a desire to develop uniformity of practice in dealing with the diseases and abnormalities of the puerperal state to the end that the mortality and morbidity statistics may be diminished to the irreducible minimum. In all departments of medical practice this ambition to secure the best possible results has led to careful surveys and conferences. Intensive study of any medical problem has led to better understanding of the difficulties encountered.

There is probably as much variation in the practice of obstetrics as in the practice of the other branches of surgery. The best surgeons cannot guarantee the highest degree of diagnostic ability and technique in the general practice of surgery throughout the country, neither can the most skillful obstetrician assure the people that every doctor attending the patients in the puerperal state can render the safest possible service, but leading surgeons and obstetricians are trying to elevate the practice of their respective followers. This is no indictment of the general practitioner, who by desire or chance

serves the pregnant woman and her child, but it is an accepted fact that pregnancy has dangers, and pregnant and parturient women die.

The published statement of the officers of the section should be studied.

It is common belief that the toxemias of pregnancy are dealt with differently by different people. It is reasonable to expect that the section will recommend certain principles in the attack on these morbid states which will help the rank and file of obstetricians.

The eight cases of septicemia bring forward questions which we trust can be answered. We may have to modify the ordinary explanation of septicemia, for the occurrence of this disease in our best hospitals and under the care of eminent men may be due to factors over which we have no adequate control, but it is the business of the profession to know beyond question whether sepsis following Cesarean section or in otherwise uncomplicated cases was due to hospital administration, the operation, the patient herself, her environment, or other factors not usually considered.

Given time and means for study we expect the section to be of the greatest value to our people, but it can never do its best work unless the doctors throughout the State are willing to co-operate. This can be done by sending to the section report of cases with questions. For example, some practitioners of many years contend that there is no such thing as an adherent placenta. Experience shows that there is such a condition or the attendant is led to think that there is. There are other vital questions concerning the management of the third stage of labor which have a vital bearing on the immediate and future health of the patient. To some these seem to be minor considerations, but some good doctors are very much concerned during this stage.

In asking questions or presenting records it should be remembered that someone may profit by the experience of another.

We believe the section will help you. Give it an opportunity and do not forget the consultation service offered.

THE FAMILY PHYSICIAN AND MEDICAL LEGISLATION

THE Committee on State and National Legislation earnestly requests the members of the Auxiliary Committee to interest themselves in the proposed legislation of 1924, in order that the legislators may be properly informed of the policies of the Massachusetts Medical Society. A personal interview is more valuable than an abundance of literature, yet many legislators receive only the literature of our opponents, and are naturally influenced thereby.

The chairman of the Committee on National Legislation of the American Medical Association is in active coöperation with the committees of the various state societies, and the latter are well informed of proceedings in other States, by interchange of bulletins, and by correspondence.

There is some difficulty in interesting each individual member of our Society in the need of favoring measures for medical progress. The importance of using the advantages of a family physician to promote public sentiment in legislative affairs should be appreciated by all our members.

FEDERAL ASSISTANCE IN RURAL HEALTH WORK

THE Government has shared in rural health work in sixty counties or districts in seventeen States, continuing the work done in 1920, 1921, 1922, and up to the close of the fiscal year, June 30, 1923.

In Alabama six counties had this service, Georgia had five; Missouri, eleven; Virginia, fifteen; West Virginia, six; North Carolina, five; Montana, two; New Mexico, two, and California, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Mississippi, Oklahoma and Vermont, one each.

The work in Vermont in the last year covered the period of time from July 1, 1922, to March 15, 1923, and was conducted under a federal appropriation of \$1760 and a state appropriation of \$2951.50. Other agencies contributed \$110. Eighteen lectures were given to 725 persons, 7795 bulletins were distributed, one newspaper article printed, eighteen sanitary inspections were made of private premises, and 463 of schools, churches, and stores. One hundred and eighty-nine special inspections were made of food product places, 10 visits made under communicable disease control, 52 cases quarantined, 27 prophylactic treatments given to persons exposed to possible venereal infections, 1071 Schick tests made and 346 toxin-antitoxin inoculations. Under "Child Hygiene" 1597 children were examined, 1169 found to be defective, 1764 defects found, 54 consultations participated in, and 195 home visits made. There were 591 laboratory examinations conducted, of which 233 were positive. Thirty-five nuisances were corrected, and 544 treatments induced for correction of physical defects among school children.

The work in Massachusetts was conducted in the Cape Cod District, and during the past year covered the period from July 1, 1922, to June 30, 1923. The Federal Government contributed \$2499.96 and the municipalities \$6705.76. Dr. R. B. Sprague, formerly a district health officer in the Department of Public Health, was in

charge. He is now director of school hygiene in New Bedford. The details were as follows: Sixty-nine lectures were given to an attendance of 1979 persons, 2701 bulletins were distributed, and 20 newspaper articles were printed. Sanitary inspections were made of 159 private premises, and 172 schools, churches and stores, and 2743 special inspections were made of food product places. One hundred and ninety-six visits were made to communicable disease cases and suspects, and 183 cases were quarantined. One curative treatment was given for prevention of venereal disease. Two hundred and seventy-five Schick tests were given, 312 cows tuberculin tested, and 29 complete diphtheria toxin-antitoxin inoculations given. In the infant and pre-school department there were 29 examinations conducted and 22 babies and children examined. Ten group conferences were held with mothers and 20 home visits made. Two thousand and one school children were examined, of which 1184 were found to be defective. One thousand, six hundred and fifty-seven defects were found. There were 93 consultations participated in and 245 home visits made. Sixty cases attended the nutritional classes. One hundred and eighty-six laboratory examinations were conducted, of which 26 were positive. One hundred and forty-nine public milk supplies were radically improved, 14 nuisances corrected, and 1528 treatments were induced for the correction of physical defects among school children.

The federal coöperation is furnished on condition that a whole-time local (county or district) health service be established. This whole-time health officer is given a status of field agent in the Public Health Service, and he serves as local director of the demonstration. He must have qualifications acceptable to each of the co-operating agencies.

The Public Health Service evidently feels very well satisfied with this type of coöperative health service because of its uniformity and economy of administration, and claims that the results are eminently gratifying, and the recommendation is made that the widest possible extension of the methods should be employed.

As a demonstration of up-to-date methods it appears to have been valuable, but if not carried out more generally by the States one may be fearful that the communities would be quite likely to relapse.

If the Departments of Health in the several States are convinced that no better methods could be employed, it is reasonable to expect that now that the demonstration has been made each State would continue to work along these lines in all sections where the service is needed. The execution of the scheme in Massachusetts seems to have been free from the objection to federal control of state activities and thus far seems to be above criticism, but to those who feel suspicious of the dangers of federal inva-

sion of state functions there will always be the hope that a State having the resources of funds and human talent that are found in Massachusetts could carry out all forms of public health activity equally well alone. Even in important problems of this sort many of our citizens have a feeling that it is more dignified to keep out of the beneficiary class, for it is generally recognized that self-respect in public affairs as well as among individuals demands self-reliance rather than a desire for charity, and any federal grant encourages the extension of a system of bureaucracy and paternalism.

There is much to be said on both sides of this question, but if Massachusetts prefers to decline federal aid in one department of public health work, why not be consistent and ask our State Department of Health to inaugurate a service similar to the Cape Cod demonstration wherever there may be need of it?

Miscellany

MORTALITY STATISTICS

MORTALITY FROM DIABETES: 1922

THE Department of Commerce announces over 17,000 deaths in 1922 from diabetes mellitus in the registration area, which comprises 85 per cent. of the population of the United States. Within this area the death rate from diabetes per 100,000 population was 18.4 as compared with 16.8 in 1921.

To permit better interstate comparisons in 1922, the table gives for 34 States adjusted rates (allowances having been made for differences in the sex and age distribution of the population in the various States). In these 34 States the highest adjusted rate (25.1) appears for New York, and the lowest (8.1) for Kentucky and also for Tennessee.

Of the nine States showing adjusted rates by color, the highest rate from diabetes for the white population is 19.1 per 100,000 for Maryland, and the highest for the colored is 15.9 for the same State. The lowest adjusted rate for the white population is 7.5 for Kentucky, and the lowest for the colored is 5.9 for Mississippi.

For the 30 States in the registration area of 1918, the death rate from diabetes per 100,000 population was 16 in 1918 and 19.1 in 1922.

	Deaths	Adjusted rate
Massachusetts	954	21.
Vermont	95	20.5
New Hampshire	139	22.9
Maine	196	18.6
Connecticut	327	21.3
Rhode Island	144	21.2

MORTALITY FROM PUERPERAL CAUSES: 1922

The Department announces lower death rates of mothers from childbirth or puerperal causes in 1922 than in any year since 1916.

For the nine States and the District of Columbia (constituting the "Birth Registration Area" of 1915, exclusive of Rhode Island), the death rate from puerperal causes in 1922 was 6.2 per 1,000 live births as compared with 6.5 in 1921, 7.6 in 1920, 6.8 in 1919, 8.9 in 1918, 6.3 in 1917, 6.2 in 1916, and 6.1 in 1915.

The relatively high rates for the years 1920, 1919, and 1918 were doubtless due, for the most part at least, to the epidemics of influenza which prevailed in those years and which took heavy toll of pregnant women. The ratio of deaths from childbirth to the number of women bearing children in 1922 was 1 to 150.

Of the 30 States for which figures are available, South Carolina has the highest 1922 death rate from puerperal causes (10.7 per 1,000 live births), and Minnesota the lowest (4.9). Separate rates for the white and colored are shown for only the six States of Kentucky, Maryland, Mississippi, North Carolina, South Carolina, and Virginia. For 1922 the highest rate for the white appears for South Carolina (8.5) and the lowest (5.3) for Maryland, while for the colored the highest rate (18.5) is for Kentucky, and the lowest (8.4) for Maryland.

The rates for the New England States are as follows: Maine, 7.6, Vermont 7.4, Massachusetts 6.8, New Hampshire 6.5, Connecticut 5.7, and Rhode Island 5.6, all except Rhode Island showing slightly higher rate for 1922 as compared with that of 1921.

MORTALITY FROM TYPHOID FEVER: 1922

There were 6981 deaths from typhoid fever in 1922 in the death registration area, which comprises 85 per cent. of the total population of the United States. The death rate in 1922 from this disease was 7.5 per 100,000 population, the lowest ever shown for the registration area.

Of the 34 States shown for 1922 and 1921 only four show higher rates in 1922 than in 1921, as follows:

State	1922	1921
California	4.7	4.3
Colorado	11.4	10.1
Mississippi	19.0	18.6
New Hampshire	5.2	3.6

In 1922 Rhode Island had the lowest adjusted rate (1.2 per 100,000 population), while South Carolina had the highest (23). Of the nine states showing adjusted rates by color, the lowest rate for the white population in 1922 was 5.9 and the lowest for the colored was 13, both for Maryland, while the highest adjusted rate

for the white population was 18.4 for Kentucky and for the colored 30.8 for South Carolina.

The adjusted rate for Connecticut is 3.0, Massachusetts 2.1, Maine 6.2, New Hampshire 5.4, Vermont 4.7.

ONE YEAR OF COMMON COLDS AND ASSOCIATED INFECTIONS

THE amount of absenteeism in large business and industrial establishments due to minor illnesses is seldom appreciated until the facts are thoroughly reviewed. The common "colds" are among the chief sources of lost time. In a group of about 6700 clerical employees of the Metropolitan Life Insurance Company at the Home Office, during the fifty-two weeks ending July 28, 1923, 2824 "colds" which involved disability for work were reported to the Medical Division, which cares for the health of the clerical staff. These disabling affections occurred at a rate of 420.7 per 1000 employees for the year. The average days of disability for this illness per person on the payroll for the year was .9, and the average days per case were 2.2. In all, there were 6233 days lost in the year from these conditions, which included head colds or coryza, acute bronchitis, and tracheitis. Other associated conditions were excluded because of the impossibility of determining in how many cases they were associated with common colds.

It seems that these infections of the upper respiratory tract have two periods of maximum incidence: the first, following the advent of cool weather in the late summer and early fall; the second, occurring during the following January or February, when the coldest weather of the winter prevails. It has been suggested by Dr. Dochez and others that this signifies that there are two types of catarrhal fevers, the one appearing in the early fall, succeeded by the other in mid-winter, accompanied or followed by maximum incidence of severe infections of the respiratory system, including pneumonia, and by a somewhat general mixture and confusion of all types of respiratory infection. This leads to the suggestion of the dependence of one group of respiratory infections upon the other. Are the infections of the upper respiratory system in the early months of cool or cold weather the necessary foundation for the severe pneumonias that appear later on? Others have suggested that we are confronted in this annual progression of respiratory diseases only with gradually increasing virulence of many types of organisms.

In the present series, two cases of pneumonia were reported among these employees in December, one in the following March, and seven in April. These insufficient data indicate roughly a time-relationship that is consistent with the

hypothesis above stated; but this is obviously subject to a further and more conclusive test from more extensive data. What is needed is an adequate volume of records whereby the cases of upper respiratory disease in the earlier months of cool or cold weather can be related to the incidence of major respiratory infections of later months.

Our data also point out that there are very distinct relationships between these respiratory infections and changes in the weather conditions. We found, for example, that the number of common colds varies with the rise and fall of the weekly mean temperature. A drop in the weekly mean temperature of 10 degrees carries with it an increase of 18 common colds per week in this group of 6700 people. On the other hand, such other weather elements as mean relative humidity and total precipitation show only slight influence on the rise and fall of the incidence of common colds.—Statistical Bulletin, Metropolitan Life Insurance Company.

A MEDICAL COLLEGE ON MOUNT OF OLIVES

A MODERN medical college and hospital will soon look down on Jerusalem from the Mount of Olives, according to an announcement by Dr. Nathan Ratnoff, president of the American Jewish Physicians' Committee, which has purchased eight acres of land for this purpose for \$50,000.

Dr. S. S. Goldwater, former Health Commissioner of New York and an authority on hospital construction, has volunteered to visit Palestine next summer and complete the plans for the hospital building. The hospital project is the result of a trip of inspection to Palestine last summer by a committee of New York physicians, including Dr. Ratnoff, Dr. David J. Kaliski, and Dr. Samuel J. Kopetzky. The college and hospital are to be departments of the Hebrew University which is being built in the general scheme of Palestine development, on which the Palestine Foundation Fund, Keren Hayesod, already has spent about \$5,000,000.

The money for the medical college was contributed by physicians in the United States through the efforts of the American Jewish Physicians Committee. The first building in the group has cost \$125,000. A check for \$25,000 to complete the structure was handed by Dr. Ratnoff to Dr. Chaim Weizmann of the World Zionist Organization on his recent arrival here from London. In order to cover the construction and operating cost of the hospital, the physicians will ask individuals to endow beds, of which there will be 250. Dr. Ratnoff said that the building now being erected will be ready for occupancy next June.

A textbook on medicine in the ancient Hebrew

tongue, for which there has been coined an entirely new terminology in Hebrew for medical terms, has been completed by Dr. L. Goldin, Dr. A. Goldstein, and Dr. L. M. Herbert, all of New York.

The medical college will be administered by a Board of Governors, to consist of five representatives of the American Jewish Physicians Committee, five representatives of the World Zionist Organization, and one member to be chosen by these two groups.—*New York Times*.

ESSEX NORTH DISTRICT MEDICAL SOCIETY

THE eighty-second semi-annual meeting of this society was held in Centre Church vestries, Haverhill, Mass., Wednesday, January 2, 1924.

Dinner was served.

Following the dinner a business meeting was held. The following papers were presented:

1. The President of the State Society, Enos H. Bigelow, M.D., of Framingham Center, spoke upon the "Massachusetts Medical Society."

2. Miss Sally Johnson, R.N., superintendent of the Training School for Nurses at the Massachusetts General Hospital, spoke in favor of the proposed bill for the licensure of nursing attendants, which is to be introduced into the Legislature by the Massachusetts State Nursing Association.

3. F. Gorham Brigham, M.D., of Boston, Assistant in Medicine at Harvard University Medical School, spoke upon "Modern Treatment of Diabetes."

Discussions followed.

The History of the Massachusetts Medical Society, by its Secretary, W. L. Burrage, M.D., of Brookline, is ready for distribution. Additional orders may be placed with the secretary of Essex North. The price is \$6.00

VICTORY MEDAL OF FRANCE FOR RED CROSS PERSONNEL

AMERICAN Red Cross personnel who saw service in the World War for certain periods are entitled to the French victory medal, the French Embassy states in a letter to National Headquarters. The service must have been as follows:

All members who were recipients of the Croix de Guerre or were wounded, regardless of the duration of service.

Members who were attached to fighting units for not less than three months.

Members who were attached to hospital or ambulance units in the army zone for not less than 18 months.

Persons eligible under the above specified clauses may apply for the French victory medal, addressing communications to Brig.-Gen. Georges A. L. Dumont, Military Attaché, French Embassy, 1501 18th Street, N. W., Washington, D. C.

HEALTH BULLETIN OF THE BROOKLINE BOARD OF HEALTH

THE December bulletin should be sent to every member of the Legislature for, in addition to important articles on health matters, the one on vaccination should be read by everybody having the policies of the State in keeping.

Vaccination has been in legislative parlance a hardy annual, and although the subject has been discussed before the Committee on Public Health year after year, the General Court has not felt favorable to more definite policies. If our public men could have settled convictions the anti-vaccinationists would have less influence. Careful consideration of the facts, apart from the heated debates, might be convincing.

CONTROL OF X-RAYS

Science reports that vagrant and injurious x-rays may be confined to the room in which they originate by the use of barium in plaster or paint. Maximilian Toch, a chemist of New York City, reported at the recent meeting of the American Institute of Chemical Engineers. Long exposure to x-rays which have escaped from doctors' offices through walls, floors or ceiling have been reported to have caused serious injury to persons in adjoining rooms. Mr. Toch said. To prevent this, lead which is impervious to the rays has been used in metallic form as a sheathing of x-ray rooms; but the metal is heavy and buildings with rooms so equipped require strengthening. This is not necessary if some compound of barium be used instead of lead. Mr. Toch said, since barium compounds are opaque to x-rays. His method has been either to mix the barium with the wall plaster or to use barium compounds in the wall paint. Either method keeps the rays where they belong.

TIMELY LEGISLATION IN NEW JERSEY

THE State Board of Medical Examiners of New Jersey are planning to secure legislation which will give to the Board authority to reject all applicants who are unable to meet the requirements and, further, that all medical institutions must get the approval of the state Board before charters may be granted.

HARVARD MEDICAL SOCIETY

A MEETING was held in the Peter Bent Brigham Hospital Amphitheatre Tuesday evening, January 8, 1924, at 8.15 o'clock, with the following program:

1. Exhibition of Cases.
2. Destruction of Uric Acid, by Dr. H. Berglund.
3. New Staining Methods for Tumors of the Nervous System, by Dr. P. Bailey.

WORCESTER DISTRICT MEDICAL SOCIETY

THE regular meeting of the society was held at St. Vincent Hospital, Wednesday, January 9. The business meeting began at 5.30 p.m., lunch was served at 6 o'clock, and the literary part of the program began about 7.

1. Hemochromatosis—Report of a Case. Dr. J. J. Dumphy.
2. Discussion of the Pathogenesis of Hemochromatosis, Dr. F. B. Mallory, Boston.
3. Pernicious Anemia, Dr. T. J. Foley.
4. Insulin, Dr. M. B. Fox.

CHRISTMAS SEAL SALE FOR 1923

THE Boston Tuberculosis Association states that the seal sales to December 31 have yielded more than \$33,000. Further returns are expected to bring the total up to the \$50,000 that will assure the boys' wing to Prendergast Preventorium.

Obituary

HENRY ORLANDO MARCY, M.D.

DR. H. O. MARCY, one of the prominent medical men of Massachusetts for the past forty years, among the oldest of the Fellows of the Massachusetts Medical Society, died at his home in Cambridge on New Year's day, 1924, at the age of eighty-six, having been active in professional and public life up to a year ago.

The son of Smith and Fanny Gibbs Marcy, he was born in Otis, Mass., June 23, 1837. Educated at Wilbraham Academy and Amherst College, he received his medical degree from Harvard in 1864, Amherst conferring on him an honorary A.M. in 1870 and Wesleyan an LL.D. in 1887. He married Miss Sarah E. Wendell of Somersworth, N. H., in October, 1863, she surviving him. The death of their son, Henry O. Marcy, Jr., a physician of Newton and Boston, was noted in these columns in May, 1922. Dur-

ing the Civil War Dr. Marcy served as assistant surgeon to the 43d Massachusetts Volunteers, surgeon to the 35th U. S. C. T., medical director of Florida, and later medical director on Sherman's staff in the Carolina campaign. On resigning from the army in 1865 he settled in practice in Cambridge. In 1869-1870 he studied abroad at the University of Berlin and in Edinburgh and London, being Lister's first American pupil in the latter city. On his return to Cambridge he took up the study of the antiseptic methods of wound treatment, using and advocating buried animal tendons as sutures. He translated G. B. Ercolani's "The Reproductive Process," two vols., 1884; wrote "The Anatomy and Surgical Treatment of Hernia" and "The Radical Cure of Hernia," 1889; "The Perineum, Its Anatomy and Surgical Treatment," 1889, and many monographs and papers on a variety of subjects, being a constant attendant at medical meetings, where he presented pathological specimens, read papers, and took part in the discussions.

In 1884 Dr. Marcy was president of the American Academy of Medicine. It was in that year that he made a motion at an adjourned meeting of the Massachusetts Medical Society that a committee be appointed to consider the enactment by the Legislature of the State of a medical practice act. Although it was ten years before the act came into being Dr. Marcy should have the credit of initiating a movement which was ultimately crowned with success. He was president of the American Medical Association in 1892, a member of the British Medical Association, and a Fellow of the American College of Surgeons.

For nearly thirty years, beginning in 1880, Dr. Marcy conducted a private hospital in Cambridge.

Despite his activities in the medical field, Dr. Marcy took great interest in public affairs and was a strong factor in many forward movements. He was one of the men who purchased that portion of Cambridge between Front street and the river front, which at that time was nothing but marshland. It has since been developed into some of the most valuable property in Cambridge, and on a part of it now stand the beautiful Technology buildings.

Dr. Marcy appeared before the Massachusetts Legislature in advocating new propositions and always showed a keen and shrewd knowledge of conditions. In 1908 he appeared before the Committee on Metropolitan Affairs and advocated the proposition of increasing the width of the Charles River embankment on the Boston side.

In his name stands much property in Cambridge, including the site of the hospital he maintained there for so many years, and his home beside it on Massachusetts Avenue, at a point nearly opposite the Cambridge City Hall.

GODFREY RYDER, M.D.

Dr. GODFREY RYDER, a prominent physician of Malden, died at the New England Sanitarium, Stoneham, Mass., December 28, 1923, at the age of sixty-nine, after an illness of two months.

Descended from Mayflower stock, he was born in Provincetown, July 16, 1854, a son of Godfrey and Phoebe Fuller Ryder. After graduation from Harvard College in the class of 1877 and Harvard Medical School in 1880, he studied in Vienna, in Berlin, and in London, where he served as house officer at the London Hospital, Whitechapel. Returning to America in 1886 he settled in Malden, marrying there Miss Gertrude Yale, a descendant of Elihu Yale, the founder of Yale University. She survives him.

Dr. Ryder devoted himself largely to the practice of surgery, being surgeon to the Malden Hospital. He delivered the annual address before the Malden Historical Society in 1902, was a councilor from the Middlesex South District of the Massachusetts Medical Society from 1911 to 1919 and president of that district in 1914-15.

Besides being a member of the American Medical Association he was on the board of trustees of the Malden Public Library, a member of the Malden and Kernwood Clubs, and a Mason.

ADDISON SANFORD THAYER, M.D.

1858-1923

SOME men have one idea, a few have two, but Dr. Thayer seemed to have three, steadily fixed in his mind for years. One of these to him was his love for Harvard and the library, and the Medical School connected with it; the second was the Bowdoin Medical School and all connected with the college there at Brunswick; and the third was the Fraternity Club in Portland, composed of some thirty brilliantly minded men who met winter Mondays for years and interchanged thoughts and themes.

Addison-Sanford Thayer, the son of Addison Parsons and Lydia Sanford Partridge Thayer, was born in Medway, Massachusetts, August 5, 1858, educated at Phillips Exeter, and then at Harvard, where he obtained his degree of A.B. in 1881. He taught Latin and Physiology in the Portland High School off and on for four years, meanwhile studying medicine with the teachers of the Portland School for Medical Instruction, and taking lectures at the Bowdoin Medical School. At this school he was graduated in 1886, presenting a thesis which mirrored the entire course of his life,—"Alimentation in Disease." No physician seems to have studied more ardently this topic which in all of his long practice he considered of the highest importance for the ultimate recovery of his

patients. Food and medicine combined were his faith and his treatment always.

After obtaining his degree at Bowdoin, he followed this up with two courses of lectures at the Harvard Medical School, where he obtained his second degree in medicine in 1888. He then settled in Portland for life and married there, early in his practice, Miss Ida Lawrence Greene, daughter of a very famous Portland surgeon, Dr. William Warren Greene, a man who dominated surgery in Maine for years by his boldness and audacity at a time when surgery was mostly extremely conservative. Mrs. Thayer was of great assistance to her husband in his professional and literary work, and now survives him, and compels our sympathy.

Dr. Thayer early saw that the care and treatment of children was of the utmost importance to the public health, and into that topic he worked with patience and with courage, making himself, as one might say, the first practitioner for the diseases of children known in Maine. In return for his early proven skill, he was rewarded with the appointment of instructor at the Bowdoin school, and later on he was advanced to a full professorship in children's diseases, and finally he was unanimously chosen the Dean of the school.

It must here be said, to his honor, that with small clinical material directly connected with the lecture rooms at Brunswick, he did excellent educational work, and gradually obtained its extension into the larger material connected with the hospitals in and about Portland. It may be truly said that students graduating at the Bowdoin Medical School during the Deanery of Dr. Thayer obtained a trustworthy medical education, fitting them for a wide country practice, and laid the foundation which, with post-graduate courses elsewhere, enabled the Bowdoin graduate to stand side by side in skill and practical surgery and medicine with the graduates from any other school.

These results were, we regret exceedingly to say, undermined by the public investigations carried on from metropolitan centers, so that the Bowdoin school ceased to instruct students—a distinct loss to medical progress in northern New England.

Amongst the contributions of Dr. Thayer to these controversies, we refer to his able reply to Mr. Flexner, as printed in the *Maine Medical Journal*, a model of courteous controversial argument.

In the Maine Medical Association, he was a leader and once its president, and to its meetings for years he contributed many valuable papers, mostly on "Medicine of Today," "Modern Medicine," "The Latest Clinical and Laboratory Methods," and so on. His address as president was a model.

To the Fraternity Club he contributed yearly

some attractive paper, not long generally, but to open up discussions amongst those present, and in this list may be included "Twentieth Century Medicine," and a genial paper entitled, "An Alien Enemy," who, on reading, proved to be a mere child, who was, however, under the opinion of our lawyers, an alien because coming from a foreign land, and an enemy because the people of her nation were at war with us. She, the poor child, was about thirteen years of age, yet an "alien enemy."

In spite of his admiration and care for the Bowdoin school, the Dean thereof favored the Harvard school when opportunity offered, and sent students there for post-graduate courses. He was also fond of the College Library and never failed to obtain from the librarian, a friend of his, the valuable loan of books on generalities and on medicine from the shelves for students of biography and history alike.

Personally, Dr. Thayer was a very courteous gentleman, but a bit inaccessible to visitors unless he were prepared beforehand with the object of their call. Knowing that, he was always ready with his wisdom and kind advice. He had a whimsical smile and an odd fashion of twisting about his face and his lips which made you smile at times, but underneath them all you saw the kindness of mind and the geniality which endeared him to a very large clientele, not only in Portland, but in consultations extending into every part of the State.

He passed away suddenly December 14, 1923, all too suddenly for his friends to bear, but they will continue to think of him, and to regret that they had no chance to express even the forebodings of a long and kindly farewell to one whom they so deeply admired.

J. A. S.

DEATH NOTICES

DR. VICTOR ISAAH SHAPIRA, a fellow of the Massachusetts Medical Society, died at his home in Jamaica Plain, December 26, 1923, at the age of sixty. He was a graduate of the Baltimore University School of Medicine in 1905 and of late years he had practised urology as a specialty.

DR. CHARLES A. MURPHY of 149 Howard Street, Roxbury, for 20 years a practising physician, died at his home, after an illness of about a year. He received his education at the Boston public schools, Technology and Tufts Medical School. Dr. Murphy was 50 years old. He is survived by his parents, Mr. and Mrs. John Murphy; four brothers, Representative Daniel C. Murphy of Ward 17, and Joseph, James, Albert and William Murphy. He also leaves one sister, Miss Annie Murphy.

DR. PETER P. WHITE, formerly a practitioner for 28 years in Williamsville, Vt., died on Christmas at the home of his son, Aaron C. White, 160 Manning Street, Needham. He was born in Hebron, N. Y., 62 years ago and was graduated from the University of Vermont. Following his practice in Williamsville, he re-

tired and lived in North Granville, N. Y., for several years. Nearly three years ago he came to Needham. Besides his son, he is survived by a widow, who was Miss Imogene Dickinson, and by five brothers and a sister.

DR. WILLIAM ROGERS, formerly of Bar Harbor, Me., but of recent years a resident of Brookline, died recently at his home in that town, in his 84th year. He was born in Hampden, Me., in 1840, and during the Civil War served in the United States Navy, being discharged with the rank of ensign at the close of the war. He was a graduate of the Bowdoin Medical School, with the class of 1872, and practised medicine in Hampden for six years. He went to Bar Harbor in 1878, remaining in practice there for 26 years. He was a member of the Loyal Legion, and of Edward Kingsley Post, G. A. R., of Boston, being surgeon of that post. He is survived by two daughters, Miss Helen S. Rogers of Brookline, and Miss Marguerite Rogers of Pratt Institute, Brooklyn, N. Y.

DR. ALFRED PETER CHIRONQUEST, a fellow of the Massachusetts Medical Society, formerly superintendent of the United States Public Health Service Hospital in West Roxbury, died at a hospital in New York City, December 31, 1923, following a major surgical operation, at the age of thirty-nine. He was educated in the Kingston, N. H., schools and at Tufts College Medical School, where he took his M.D. in 1918. During the World War he held a major's commission in the medical corps and at its close served in the Public Health Service. He had been stationed recently at the United States Veterans' Hospital 81, in the Bronx, N. Y., but his health gave out and he moved to Kingston, N. H., to practice and recover his health.

News Items

DR. HAVEN EMERSON sailed for Berlin, Germany, December 15, in order to study the situation there at first hand.

MAJOR-GENERAL H. M. NEEB, R.M.W.O., R. N. L. (retired), chief of the military medical service in the Dutch East Indies and professor of hygiene at the Technical University at Bandung, Java, has been visiting in Boston.

THE LAWRENCE MEDICAL CLUB.—Dr. R. V. Baketel of Methuen has been elected to the office of secretary-treasurer of the club. For each meeting a chairman, who acts as host, is assigned in alphabetical order.

WEEK'S DEATH RATE IN BOSTON.—During the week ending Dec. 29, 1923, the number of deaths reported was 210, against 251 last year, with a rate of 14.21. There were 24 deaths under one year of age, against 29 last year. The number of cases of principal reportable diseases were: Diphtheria, 74; scarlet fever, 111; measles, 57; whooping cough, 13; typhoid fever, 2; tuberculosis, 16. Included in the above were the following cases of non-residents: Diphtheria, 9; scarlet fever, 2; tuberculosis, 1. Total deaths from these diseases were: Diphtheria, 2; scarlet

fever, 2; tuberculosis, 9. Included in the above were the following deaths of non-residents: Diphtheria, 1; scarlet fever, 2.

Correspondence

A REPLY TO THE CIRCULAR DISTRIBUTED BY THE MIDDLESEX COLLEGE OF MEDICINE AND SURGERY

Boston, January 1, 1924.

Mr. Editor:

A short time ago I received the circular letter recently issued by the trustees of the Middlesex College of Medicine and Surgery and the accompanying open letter addressed to the President of the American Medical Association. I have read with approval your excellent editorial of December 27, and the American Medical Association and its Council on Medical Education need no further defense than you have given. In fact, the intemperate tone of the circular letter and the open letter is enough to defeat their object,—so far as that object is to interest the thoughtful and well-informed members of the medical profession.

I wish to comment on the following quotation from the fourth paragraph of the open letter: "The Committee appointed by the American Medical Association, and headed by the Dean of the Harvard Post-graduate Medical School, made its visit most unexpectedly. The Committee described this as their usual method of approach and an element of their finesse upon which they prided themselves." I do not care personally for the implied criticism in this statement, but I feel that it is better to have the facts known, since this is essentially a misstatement of the facts. In order that I might not depend solely upon my memory, I have asked Dr. N. P. Colwell, Secretary of the Council on Medical Education and Hospitals, for information on certain points established by documentary evidence. The facts, so established, follow.

The first inspection of the Middlesex College of Medicine and Surgery, the one referred to above, was made on January 7 and 8, 1918, by a committee appointed by me, as I was at that time chairman of the Council on Medical Education. It was the same committee that had served the Council on several occasions during the years of my membership in the Council on Medical Education, when it was felt, in a spirit of fairness, that a decision in the rating of a doubtful medical school ought not to rest on the decision of one or even two inspectors. This committee consisted of Dr. N. P. Colwell, Secretary of the Council, Dr. F. C. Waite, who usually made the inspections for the Association of American Medical Colleges, and myself.

This inspection, according to a memorandum made by Dr. Colwell at the time, was made at the request of Dr. Charles H. Bangs, representing the Middlesex College of Medicine and Surgery. The request was made personally and verbally on December 14, 1917, during a visit made by Dr. Bangs to the office of the American Medical Association. Dr. Bangs was informed that an inspection would be made on the next eastern inspection trip, which would probably be after the first of the year.

On December 18, 1917, Dr. Colwell sent to Dr. John Hall Smith, the registrar, the usual preliminary letter of enquiry asking for data about teachers, value of property, income, expenses, etc. A reply was received on December 31.

Unless Dr. Bangs and Dr. Smith were acting without proper authority and without the knowledge of the authorities of the College, it can hardly be claimed

with fairness that the visit of the committee was made "most unexpectedly." Dr. Colwell has no correspondence preserved that shows that the day and hour of inspection was arranged beforehand, but I feel sure that my recollection is correct that the time was arranged beforehand in correspondence between the College authorities and the Surgeon-General's Office, where I was then on active military duty in charge of the regulations governing the medical schools in their relations to the Army. I have a definite recollection that the Dean was at the College to receive us and was expecting us. I may add that it has not been the policy of the Council on Medical Education—"a finesse upon which it prided itself"—to make visits of inspection "most unexpectedly." The Council, however, has pursued the common-sense plan of conducting its inspections as far as possible while the school is in session—and without notice long enough ahead for the school to make radical changes from its ordinary teaching. The aim has been simply to study the school as it is ordinarily conducted.

The inspection made by this committee was made in the same manner and in the same spirit as those made of all other medical schools. The Council intends that the inspection shall be comprehensive and thorough. The rating is made on a liberal percentage estimate of each of a number of subjects considered important in a medical school which undertakes to give a thorough education in modern medicine. The authorities of some schools have felt that it was very exacting and searching, but I do not recall that any other school has characterized the Council's attitude as "that of a prosecuting official toward a criminal."

The statement which I quoted says that the committee was "headed by the Dean of the Harvard Post-graduate Medical School." This statement is essentially correct, but irrelevant. At that time I still held the position of Director of the Harvard Graduate School of Medicine, although on leave of absence for active military duty. The reason for my being on the committee had nothing to do with Harvard. It was based on two considerations. First, I was chairman of the Council on Medical Education. Second, I had supervision for the Army over medical schools and their students.

The regulations under the draft law permitted the students of a "well-recognized" medical school to enlist voluntarily in the Medical Reserve Corps, and such enlistment was held to fulfill the requirement for military service. Such students were permitted to remain on inactive status and to continue their medical education as a preparation to become commissioned officers in the Army. The standard adopted for a "well-recognized" medical school was the fact that its graduates were accepted for examination by 50 per cent. of the State Boards of the country. The Middlesex College of Medicine and Surgery was not so recognized by the State Boards and therefore was not classed as a "well-recognized" school by the Surgeon-General.

The College naturally desired such recognition and petitioned for it. The fact that Dr. Waite and I were both on active duty in the Surgeon-General's Office enabled the Surgeon-General to make this inspection by the Council on Medical Education also an official inspection for the Army. Had the two Army officers on the committee found conditions satisfactory, that is, if the course of training was sufficiently thorough to qualify the graduates to become satisfactory medical officers in the Army, responsible for the lives and health of the soldiers, the College would have been classed as a "well-recognized" medical school irrespective of recognition by State Boards or by the American Medical Association. It did not at that time meet this requirement. It also did not measure up satisfactorily to the requirements of the Council on Medical Education. Some of the reasons are admitted by the authorities of the College and are

stated in their open letter. They need not be repeated here.

HORACE D. ARNOLD, M.D.
520 Commonwealth Avenue, Boston.

BIRTH REPORTS

The following copy of a letter sent by the Health Commissioner of Boston might be used to advantage in some other municipalities. Doctors, as a rule, intend to comply with the laws, but sometimes need courteous reminders.

BOSTON HEALTH DEPARTMENT
CITY HALL ANNEX
BOSTON

December 31, 1923.

To the Physicians of Boston:

It has come to our attention recently that in several instances physicians in this city have inadvertently failed to report births.

You, of course, are aware of the importance of a birth certificate to a person and also to his family, especially in later years, and the Health Department and the Registry Department are anxious to secure for Boston a high standing in birth registration, which will mean a consequent lowered infant mortality. The Health Commissioner and the City Registrar have been perusing the records recently, and find that through laxity in certain instances Boston is not credited with its full quota of births. We are going to ask you, therefore, to please coöperate with us to the extent of looking over your birth records for the past year to see if you have not failed to report one or more of such births. This is likely to happen in any instance, and we respectfully request that in all such cases, even if a doubt exists, and even though you may not have complete registration details, that you kindly mail such birth certificates to the office of the City Registrar as quickly as possible.

Other cities boast of their low infant mortality rate, and we are quite satisfied with the progress that Boston is making. However, inasmuch as the infant mortality rate is based on the number of infants that die in the first year of life as against the number of babies born, this rate is really determined on the number of births reported. You can see, therefore, that the greater the number of births recorded, the lower Boston's infant mortality rate will be.

We sincerely hope that you will coöperate with us, and help the City of Boston in this respect.

With sincere wishes for the New Year, we are

Sincerely yours,
F. X. MAHONEY, M.D.,
Health Commissioner.
E. W. MCGLEEN,
City Registrar.

NOTICES.

ANNUAL MEETING OF THE AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

Bloomington, Illinois, January 23rd, 24th, and 25th, 1924. Hotel Headquarters—Illinois Hotel.

Operative Clinics at St. Joseph Hospital and Mennonite Hospital. General Sessions, Exhibits, and Registration, at the Unitarian Church, corner of East and Jefferson Streets, one block east of square. Some space for exhibits will be available free to advertisers in State Journals.

PRELIMINARY PROGRAM

The complete programme will be ready January 10th.

FIRST DAY

Wednesday, January 23, 1924

Operative Clinic—featuring different forms of Anesthesia. 8:00 a. m. St. Joseph Hospital.

1—Two thyroidectomies, local anaesthesia.
2—Two resections thyroid, Nitrous Oxide-Oxygen anaesthesia.

3—Two thyroidectomies, Ethylene Oxygen anaesthesia.

4—Two resections thyroid, Ether anaesthesia.

Physicians attending clinic can register at the hospital Wednesday morning.

OPERATIVE CLINIC

2:00 p. m. Mennonite Hospital

- 1—Thyroidectomy, local anaesthesia.
- 2—Ligation Inferior Thyroid, local anaesthesia.
- 3—Ligation Superior Thyroid, local anaesthesia.
- 4—Resection Thyroid Ethylene-Oxygen anaesthesia.
- 5—Ligation one Inferior and one Superior Thyroid. Ethylene Oxygen anaesthesia.

9:00 p. m. Smoker.

SECOND DAY

Thursday, January 24, 1924

7:00 to 7:40 a. m. St. Joseph Hospital.
Demonstration of Fluoroscopy of the Heart, Thymus and Thyroid. Dr. H. W. Grote, Bloomington, Illinois; Dr. Frank Deneen, Bloomington, Illinois.

GENERAL SESSION: UNITARIAN CHURCH

8:00 a. m. Diagnostic Clinic, Dr. Andre Crotti, Columbus, Ohio.

Non-toxic parenchymatous goiters.

Toxic parenchymatous goiters.

Non-toxic diffuse colloid goiters.

Toxic diffuse colloid goiters.

Non-toxic nodular colloid goiters.

Toxic nodular colloid goiters.

9:00 a. m. Demonstration of gross Pathology of the Thyroid. Exhibition of specimens. Dr. Loyd Arnold, Professor of Pathology, Loyola University of Medicine, Chicago, Illinois.

10:00 a. m. Address, Dr. H. S. Plummer, Mayo Clinic, Rochester, Minn.

11:00 a. m. Address; Dr. Wm. Englebach, St. Louis, Missouri. "Relation of the Thyroid to the other Endocrine Glands." Illustrated by lantern slides.

1:00 p. m. Address; Commander Wm. Seaman Bainbridge, New York. "Goiter in the Navy, and in Europe."

2:00 p. m. Address; Dr. Andre Crotti, Columbus, Ohio. "The Etiology of Endemic Goiter and of Toxic Goiter."

3:00 p. m. Address; Dr. Wayne Babcock, Philadelphia.

4:00 p. m. Address; Dr. George Van Amber Brown, Detroit, Michigan. "Comparative Anatomy of the Thyroid."

5:00 p. m. Address; Dr. Edw. H. Skinner, Kansas City, Missouri. "X-ray and Goiter."

BANQUET: ILLINOIS HOTEL

7:00 p. m. January 24, 1924.

THIRD DAY

Friday, January 25, 1924

UNITARIAN CHURCH

7:00 a. m. Exhibition of cases and discussion.

8:00 a. m. Diagnostic Clinic, Dr. Wm. Wayne Babcock, Philadelphia.

9:00 a. m. History Clinic.

10:00 a. m. Address, Dr. Joseph L. De Courcy, Cincinnati, Ohio.

10:30 a. m. Radium Treatment, Dr. F. M. Hagans, Lincoln, Illinois.

11:00 a. m. Medical Treatment.

11:30 a. m. Prevention.

1:00 p. m. Goltier in Nevada, Dr. Thomas W. Bath, Reno, Nevada.

1:30 p. m. Incipient Goltier vs. Incipient Tuberculosis, Dr. Roswell Pettitt, Ottawa, Illinois.

2:00 p. m. Round table discussions. Five-minute talks.

3:00 p. m. Movie Clinic—Goltier operations.

OFFICERS: President, Dr. E. P. Sloan, Bloomington, Ill.; Vice-Pres., Dr. Geo. W. Newell, Burlington, Wis.; Secretary, Dr. J. D. Moschelle, Indianapolis, Ind.; Treasurer, Dr. J. R. Yung, Terre Haute, Ind.

ANNOUNCEMENT

The Eighth Annual Clinical Session of the American Congress on Internal Medicine will be held in the amphitheatres, wards, and laboratories of the various institutions concerned with medical teaching, at St. Louis, Mo., beginning Monday, February 18, 1924.

Practitioners and laboratory workers interested in the progress of scientific, clinical, and research medicine are invited to take advantage of the opportunities afforded by this session.

Address enquiries to the Secretary-General.

ELSWORTH S. SMITH, *President*.

St. Louis, Mo.

FRANK SMITHIES, *Secretary-General*.

1002 N. Dearborn Street, Chicago, Ill.

BOSTON CHILDREN'S HOSPITAL STAFF CLINIC

A Staff Clinic will be held in the amphitheatre on Friday, January 11, at 4:30 p. m. All physicians are cordially invited.

NEW ENGLAND PEDIATRIC SOCIETY

The eighty-second meeting of the New England Pediatric Society will be held Friday, January 11, 1924, at the Boston Medical Library, at 8:15 p. m.

The following papers will be presented:

1. The President's Address, Edwin H. Place, M.D., Boston.

2. Chronic Leucocytosis in Infants and Young Children, Thomas E. Buckman, M.D., Boston.

3. Certain Chemical Factors in the Pathogenesis of Tetany, James L. Gamble, M.D., Boston.

Light refreshments will be served after the meeting.

EDWIN H. PLACE, M.D., *President*.

JOSEPH GARLAND, M.D., *Secretary*.

DISEASES REPORTED TO MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

WEEK ENDING DECEMBER 23, 1923

Disease	No. of Cases	Disease	No. of Cases
Anterior poliomyelitis	4	Pneumonia, lobar	72
Chicken-pox	321	Scarlet fever	324
Diphtheria	216	Septic sore throat	4
Dog-bite requiring anti-rabic treatment	9	Suppurative conjunctivitis	15
Epidemic cerebrospinal meningitis	1	Syphilis	46
German measles	7	Trachoma	1
Gonorrhea	83	Trichinosis	1
Influenza	11	Tuberculosis, pulmonary	87
Measles	231	Tuberculosis, other forms	13
Mumps	190	Typhoid fever	8
Ophthalmia neonatorum	17	Whooping-cough	101

DISEASES REPORTED TO MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

WEEK ENDING DECEMBER 20, 1923

Disease	No. of Cases	Disease	No. of Cases
Anterior poliomyelitis	2	Pellagra	1
Chicken-pox	300	Pneumonia, lobar	66
Diphtheria	258	Scarlet fever	416
Dog-bite requiring anti-rabic treatment	5	Septic sore throat	2
Epidemic cerebrospinal meningitis	2	Suppurative conjunctivitis	18
German measles	8	Syphilis	34
Gonorrhea	86	Tetanus	1
Influenza	4	Tuberculosis, pulmonary	78
Measles	332	Tuberculosis, other forms	12
Mumps	118	Typhoid fever	4
Ophthalmia neonatorum	14	Whooping-cough	78

SOCIETY MEETINGS

DISTRICT SOCIETIES

Bristol South District Medical Society:

The annual meeting will be held in New Bedford, May 1, 1924.

Essex North:—Annual meeting at Lawrence General Hospital, May 7, 1924.

Essex South District Medical Society:

January 22, 1924—Lynn Hospital. Speaker, Dr. Frank H. Lacey of Boston.

March 19, 1924—Salem Hospital.

May 7, 1924—Annual meeting, Relay House, Nahant, in conjunction with Lynn Medical Fraternity.

Franklin District:—Society meets at Grandfield the second Tuesday of January, March, May, July, September. Annual meeting in May.

Hampden District:—The meetings for the year are as follows: January, 1924, at Springfield. April, 1924, at Springfield; annual meeting.

Hampshire District Medical Society:

Meetings held bi-monthly, the second Wednesday in the month, at Boyden's Restaurant, Northampton.

Middlesex South District Medical Society:

January 30, 1924—Combined meeting with Suffolk District at the Boston Medical Library.

February 27, 1924—Combined meeting with the Surgical Section of Suffolk District at the Boston Medical Library.

March, 1924—Hospital meeting; place not yet determined.

April, 1924—Annual meeting.

Norfolk South District:—Meetings first Thursday of each month at 11:30 a. m., January, February, March, April and May, at United States Hotel, Boston. The February and May meetings are stated meetings.

Suffolk District Medical Society:

January 30, 1924—In association with the Boston Medical Library and the Middlesex South District Medical Society at the Boston Medical Library at 8:15 p. m.

February 27, 1924—Meeting of Surgical Section, in association with the Middlesex South District at the Boston Medical Library at 8:15 p. m.

March 24, 1924—Meeting of the Medical Section, in association with the Boston Association for the Prevention and Relief of Heart Disease, at the Boston Medical Library at 8:15 p. m.

April 30, 1924—Annual meeting, to be held at the Boston Medical Library at 8:15 p. m.

Worcester District:

The meetings for the year are as follows: February 13 at Memorial Hospital, Worcester.

March 13 at City Hospital, Worcester.

April 10—A public meeting.

May 8—Annual meeting.

STATE, INTERSTATE AND NATIONAL SOCIETIES

Schedule of meetings of the New England Dermatological Society:

Wednesday, February 12, 1924, at 8 p. m., in the Skin Out-Patient Department, Massachusetts General Hospital.

Wednesday, April 9, 1924, at 3 p. m., in the Surgical Amphitheatre, Boston City Hospital.